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KEW DURING THE WAR YEARS.

Publication of the Kew Bulletin was suspended after the appearance of No. 3, 1941, which was issued in March, 1942. This is the first number to be published since that time and it is, therefore, desirable to place on record, very briefly, the more important events in the history of Kew during the intervening years.

The death of the Director, Sir Arthur Hill, on 3rd November, 1941, as the result of a riding accident in the Old Deer Park adjacent to the Gardens, was a sad loss, especially to those members of the staff who had served under him for a long period. He was appointed Assistant Director at Kew in 1907 and Director in 1922. Sir Arthur's services to Kew, and to botany in many of its branches, have already been recorded in published obituary notices.*

In November, 1941, Sir Geoffrey Evans, Economic Botanist at Kew, was appointed Acting Director and continued in charge till 1st September, 1943, when Professor (now Sir Edward) Salisbury assumed the directorship.

The Assistant Director, Mr. J. S. L. Gilmour, was seconded for service with the Ministry of Fuel and Power from 1940 to 1944. The Curator, Mr. W. M. Campbell, was seconded for a period for service with the Camouflage Department of the Ministry of Home Security, and Mr. G. H. Preston to the Ministry of Agriculture's advisory service.

Kew has fortunately not suffered severe damage as a result of the war. Some thirty high explosives fell within the premises and much glass was broken, particularly in the Temperate House, the Palm House, the North Gallery, and Museum I. The only buildings receiving a near miss were the head carter's house and the stables, but here neither the human occupants of the house nor the horses stabled nearby received any serious injuries. On the same occasion the Temperate House was severely damaged, but owing to the energies of the staff the collections suffered far less than was to have been expected. The Herbarium and Library had 121 panes of glass shattered during the night of 24th-25th September, 1940. Volunteer fire-fighting squads of members of the staff were on duty every night from 1st September, 1939, to 24th March, 1945. Except for intermittent short periods the Gardens and Museums were kept open

* Nature, **148**, 619–620 (1941) ; Proc. Linn. Soc. Lond. 154th Session, 280–285 (1943) ; Journ. Kew Guild, **49**, 129–139 (1943) ; Obituary Notices of Fellows of the Royal Society, **4**, 87–100 (1942).

to the public and the Herbarium and Library were never closed to visitors during the above period.

In November and December, 1940, about one-third of the Herbarium collections was moved to Oxford and stored in the basement of the New Bodleian Building by permission of Bodley's Librarian. A considerable number of the more valuable books from the Library were also sent to the New Bodleian in March, 1941, and more books and specimens in July and August, 1944. All these specimens and books were returned to Kew in October–November, 1945. The Sherardian Professor of Botany at Oxford placed rooms at Yardley Lodge at the disposal of the Kew staff. In January, 1941, rather less than another one-third of the Herbarium collections was moved to buildings in Gloucestershire (Colesbourne and Clifferdine) and travel and other books to Lypiatt Park, Gloucestershire. The rooms at Colesbourne were rented till October, 1941, when the cabinets there were moved to Daglingworth Rectory. The accommodation at Clifferdine was placed at the disposal of Kew by Sir Nigel Norman and that at Lypiatt Park by His Honour Judge Woodcock. The collections stored in Gloucestershire were returned to Kew in September, 1945. The Wallich Herbarium and some other special herbaria were stored at the Tring Museum by permission of the Director and by arrangement with the Keeper of the Department of Botany, British Museum (Natural History). The Director and staff of Kew are much indebted to all those in Oxford and Gloucestershire who, often at considerable inconvenience, made arrangements for the safe storage of the valuable collections and working accommodation for members of the Kew staff, and to the authorities of the British Museum (Natural History) for the loan of space at Tring.

Naturally, the normal work of the Herbarium and Library staff was much curtailed during the period under review. First consideration was given to protection of the collections, and this included extraction and special protection of types in addition to the evacuations recorded above. Current consultative work was kept up to date and a considerable amount of help was given to the war effort. Five members of the staff served in the Army or R.A.F., two other members were largely occupied for five years in work for the Admiralty, and one was seconded to the Foreign Office. In spite of dispersal of staff and collections a considerable amount of research was carried out and it is hoped that the results of this will be published in forthcoming numbers of the Kew Bulletin.

Members of the staff of the Museums were able to continue with their normal work without the troubles of evacuation. Various topical exhibits were staged in the Museums. The department was largely responsible for starting the collection of medicinal plants which was subsequently organized on a national scale. The vitamin C content of rose hips and of various *Juglandaceae* was surveyed. A short basketry course was carried out in conjunction with the National Federation of Women's Institutes.

At the Jodrell Laboratory the microscopical identification of plant materials was continued and included investigation of some from enemy sources. Special work included the preparation of fibre of the common nettle and experiments on other uses of nettles ; research on the rubber

content of *Taraxacum kok-saghys* and on the production of pith and pegwood from elder. Fundamental work on the systematic anatomy of the Dicotyledons, commenced before the war, was continued. Research was carried out in cytology and physiology by visitors including war refugees from the continent.

Difficulties were experienced in the maintenance of the living collections through the withdrawal of the younger and more active members of the staff for military service. Their places were filled in a large measure by women, who did excellent work in almost every section of the establishment. The lawns in front of Kew Palace and other areas were devoted to the cultivation of fruit and vegetables, and demonstration allotments, cropped according to standard plans, were maintained for the benefit of the public.

Experiments were carried out on the use of the " rose ends " of potatoes for propagation in place of the normal seed which demonstrated the practicability of this method as an effective means of economising material and saving some 85 per cent. of weight so that air transport is practicable. Also crops of various drug plants such as Belladonna were cultivated with considerable success.

The following changes in the staff, additional to that of the Directorship, are recorded :

Dr. R. W. G. Dennis was appointed to the Herbarium staff as Mycologist on 1st October, 1944.

Mr. K. N. Kaul, who had been Botanist for India in the Herbarium from July, 1939, returned to India in October, 1944. Dr. D. Chatterjee took up the duties of the post on 8th May, 1946.

Dr. T. A. Sprague retired from the Deputy Keepership of the Herbarium and Library in November, 1945, and Miss E. M. Wakefield, M.A., succeeded him. Mr. A. D. Cotton retired from the Keepership on 31st January, 1946, and Dr. W. B. Turrill was appointed Keeper from 1st February.

Mr. J. S. L. Gilmour resigned his post of Assistant Director and became Director of the R.H.S. Gardens at Wisley on 1st June, 1946.

Mr. A. Osborn retired as Assistant Curator (Arboretum) in March, 1945. His work has been taken over by Mr. S. A. Pearce, and Miss E. V. Paine has been appointed Acting Assistant Curator in the Decorative Department.

REVIEW

Flora of Illinois.*—This flora consists essentially of keys to the families, genera, and species of vascular cryptogams and seed-bearing plants of Illinois, one of the states of the Great Central Plain of North America. The sequence of families is chiefly that of Engler and Diels. Two text-maps are included, one showing the botanical divisions (termed a vegetational map) and the other an outline map of the counties. Local names, flowering periods, and outlines of habitats and ranges are given for the species, or for many of them. Introduced plants that have become more or less naturalized are included. The founts used are very clear and the general production gives a pleasing impression. One criticism suggests itself to a botanist who likes to determine plants, at least tentatively, in the field. The size (9 × 6 inches) is too large for the average pocket (though American botanists may have pockets more generous than those of British utility suits) and the weight is unduly heavy through the use of rather thick glazed paper.

The original vegetation of Illinois was sharply differentiated into grassland and hardwood forest, the former mainly in the central and northern, the latter in the southern parts. The soil over much of the state is, however, very fertile, so that with the advent of colonization the surface has been very largely transformed into agricultural land. In spite of this destruction and modification of the natural plant cover, the flora is a rich one. 2,124 species of vascular plants are here recorded as growing spontaneously in Illinois, and of these 1,786 are indigenous. Trees and shrubs belong to 49 families, 111 genera, and 302 species. *Salix* has 17, *Quercus* 19, and *Crataegus* 14 species. Herbaceous plants belong to 113 families, 713 genera, and 1,822 species. *Carex*, with 114 species, is the largest genus in the flora. There are 70 genera and 215 species of grasses, of which 166 species are native, and *Panicum* (36 species) is the largest genus of *Gramineae*. *Compositae* (63 genera, 243 species) make the largest family. Vascular cryptogams (63 species) and woody plants are surprisingly high in numbers for a prairie state. These figures must still be considered tentative for, it is stated, more than half of the 102 counties of the state are almost unexplored botanically while the distribution of the " lower plants " is comparatively unknown.

Illinois has an area of 57,926 square miles and most of this has a low elevation and comparatively level surface. At least nine-tenths of the surface was glaciated during the Pleistocene Ice Period (with four advances of the ice-sheet into the state). The flora is mostly of a southern type, boreal elements being rare. Eight botanical divisions are recognized but these are based principally upon the broader topographical features, including the effects of glacial geology, rather than upon the ranges of communities and species, though, of course, there are some important correlations between topography and distribution. The correlation between glacial deposits and distribution (both local and general) should be of considerable interest if worked out in detail, because the Ozark Ridge, in the south of Illinois, was the most southerly latitude reached by the North American ice-sheet.

W. B. TURRILL.

* By George Neville Jones. The American Midland Naturalist, Monograph No. 2, The University Press, Notre Dame, Ind. April 1945, pp. 318, 2 maps, $4 cloth bound, post paid.

A KEY TO THE CARICES OF MALAYSIA AND POLYNESIA.

E. Nelmes.

Since completing a descriptive, and publishing a preliminary, account of the Australian *Carices* (see Proc. Linn. Soc. 155 Sess., 277 : 1942–43) I have drawn up detailed descriptions of the Malaysian and Polynesian species of this genus. Following the plan adopted for the Australian *Carices*, a tentative key to the Malaysian and Polynesian ones is published here in advance of the fuller treatment.

" Malaysia " is here made to comprise the whole of Indo-China, lower Burma, the Malay Peninsula, and all the islands from Sumatra and the Philippines as far as and including New Guinea. It was at first intended to limit this work to Malaysia. On second thoughts, and for several reasons, it was decided to add the *Carices* of lower Polynesia, i.e., including most of the Pacific islands except Hawaii. For one thing, these Pacific *Carices*, though mostly specifically distinct from those of Malaysia, have their closest affinity with these and with the Australian species. It was also realised that the inclusion of Polynesia would complete the whole of the south Pacific area. Finally, the half-dozen or so *Carices* of Hawaii were brought into the Key. Though these have no close ties with the *Carices* of lower Polynesia, they have no strong relationship with those of any other area, and Hawaii is geographically a part of Polynesia.

War-time difficulties similar to those encountered in the work on the Australian *Carices* have arisen in an accentuated form in the task of working out the Malaysian and Polynesian species. Of these, Kew possesses rather fewer than half the types, and these have been the only ones available. I have, however, been able to examine the remainder of the Kew material from this area, as well as Kew's Indian types and the rather poor representation of Chinese and Japanese types at Kew. These are the countries with which the Malaysian *Carices* have the greatest affinity. Large collections of Malaysian *Carex* material in Java and elsewhere are at present inaccessible. When these can be examined it will no doubt be necessary to extend the Key and possible to improve it.

The number of species recognised is 138, and I have included in the treatment not only those species of which I have seen specimens but also about a score which I have not been able to examine, about half of which have been described by the eminent authority on sedges, Kükenthal. This author and several others have also described varieties and forms of a few of the species, but as I have not seen specimens of the majority of these I have excluded most of them from this preliminary publication.

So far as one can indicate probable lines of descent in a linear order, the sequence of species in the enumeration follows that of the Australian one, which was based on the view that " *Carex* had a tropical and probably Malayan origin." Those species which appear to exhibit the most primitive characters, vegetatively at least and more or less florally, have elliptic to linear-elliptic leaves, which are also very much broader than the linear leaves of most of the *Carices* of other lands. These broad-leaved species, of which *C. Adrienii* E. G. Camus and *C. euprepes* Nelmes are outstanding examples, appear to be confined to Indo-China, Burma, and southern China. Just over fifty of the species belong to the subgenus

Indocarex Baill., which occurs throughout but scarcely outside the tropics, and which, *sensu lato*, contains the most primitive species, structurally, of the three subgenera into which *Carex* is often divided, and of which the above mentioned broad-leaved species are extreme types. The subgenus *Vignea* (P. Beauv.) Nees, the members of which appear to be at the other end of the evolutionary scale, and which occur most frequently in temperate countries, is represented by only eleven of the remaining eighty Malaysian and Polynesian species, mostly on the mountains of Sumatra and Java (three of these are common British *Carices*). The remaining species are placed in what one may perhaps term the " intermediate " subgenus *Eucarex* Coss. et Germ. (though it is not truly intermediate), which has a world-wide distribution but is less common in the warmer regions.

It is interesting to note, according to the enumeration, how the early species, both in the list and in time, still largely inhabit the home of their ancestors, and how, as one goes through the enumeration, Indo-China and Siam occur less and less, and the more eastern and southern areas of the Philippines and Polynesia become more and more frequent. This picture of the evolution of *Carex* in time and in space would be still more impressive if altitude were taken into consideration, as it is hoped to do in the subsequent fuller account.

One could explain at considerable length the problems that have arisen concerning the delimitation of the species as presented in the Key, but that would make this introductory matter disproportionate to the brief treatment following it. Besides, it is hoped that many present problems will be solved in the examination of more ample material, and some decisions will be reversed or at least modified.

Key

Spike 1, terminating the stem :

Spike 2–3 cm. long, 3–4 mm. thick ; utricles 5–6 mm. long . . . . . 54. *Petelotii.*

Spike 5–12 mm. long, 4–6 mm. thick ; utricles 2·5–3 mm. long . . . 55. *capillacea.*

Spikes more than 1 on a stem :

A. Terminal and most of the other numerous spikes wholly pistillate, a few smaller ones staminate (a very tall plant with a regularly and extremely leafy stem) . . . . . 5. *hypolytroides.*

A′. Terminal spike gynaecandrous, i.e., staminate below and pistillate above, or staminate at both ends and pistillate in the middle, never pistillate at the base (for A″ see p. 7) :

Spikes usually all, but at least the lowest, peduncled, light- to dark- or reddish-brown, 0·5–7·5 cm. long, basal staminate part usually from as long as to much longer than the pistillate part :

Stigmas 3 ; utricles compressed-trigonous to distinctly trigonous :

Utricles about 5·5 mm. long, pale green, smooth, long-beaked ; spikes 2·5–3·5 cm. long . . . . . 51. *atjehensis.*

Utricles 2·25–2·5 mm. long, ferrugineous, densely papillose, extremely short-beaked ; spikes 5–18 mm. long . . . . . 109. *elibates.*

Stigmas 2 ; utricles plano-convex or biconvex :
Spikes 3–7·5 cm. long, upper 2–4 wholly pistillate above . . . 118. *Kerrii.*
Spikes 2–4 cm. long, upper 1–3 pistillate above but with a short to long staminate portion at the apex :
Utricles rather strongly 6–10-nerved ; scales blackish-red . . . 120. *teres* var. *spathulata.*
Utricles nerveless ; scales pale with reddish streaks . . . . . 121. *dimorpholepis.*
Spikes all sessile, light greenish, 0·5–1·5 cm. long, staminate flowers at the base usually so few that the spikes have a wholly pistillate appearance :
Inflorescence 12–15 mm. long ; spikes densely congested . . . 138. *pachystachya.*
Inflorescence 2–13 cm. long ; spikes contiguous to strongly separated :
Lower bracts in the form of enlarged, aristate scales ; inflorescence about 2–5 cm. long ; utricles not winged . 137. *curta.*
Lower bracts foliaceous ; inflorescence about 5–13 cm. long ; utricles winged on the margins :
Spikes about 6–9 ; pistillate scales 3·25–4 mm. long ; utricles 4–4·5 mm. long . . . . . 136. *Rochebrunii.*
Spikes about 12–21 ; pistillate scales 2–3 mm. long ; utricles 2·75–3·3 mm. long :
Spikes ovoid to shortly cylindrical ; utricles 3–3·3 mm. long . . . . . 134. *craspedotricha.*
Spikes ellipsoid-cylindrical to ellipsoid ; utricles 2·75–3 mm. long . . . . . 135. *alta.*

A''. Terminal spike wholly staminate (*C. Brownii*, *C. inverso-nervosa*, and *C. phacota* sometimes have a few pistillate flowers at about or above the middle of the terminal spike) (for A''' see p. 13) :
B. Flowering stems arising from the axils of basal foliage leaves . . . . 80. *multifolia.*

B'. Flowering stems arising from below the foliage leaves :
Spikes 1–2 cm. long ; lower bracts much shorter than the inflorescence . . . . . 76. *pleurocaula.**
Spikes 5–10 mm. long ; lower bracts longer than the inflorescence :
Leaves 2–3 mm. broad ; utricles 6–7 mm. long . . . 94. *lateralis.*
Leaves 3–7 mm. broad ; utricles 4·5–5·25 mm. long :
Stems about 5–7 cm. tall ; utricles rhomboid-lageniform . . . 77. *lageniformis.*
Stems about 15–20 cm. tall ; utricles ellipsoid . . . 92. *Elmeri.*
Leaves 16–25 mm. broad ; utricles up to 10 mm. long . . . . . 87. *Harlandii.*

B''. Flowering stems arising from the centre of the foliage leaves and developed from the shoot on which these are borne :
Spikes densely congested into an ebracteate, terminal inflorescence 133. *flaviceps.*

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* **Carex pleurocaula** *Nelmes*, sp. nov. ; affinis *C. lageniformi* Nelmes, sed culmis longioribus, spicis longioribus, bracteis inferioribus inflorescentia multo brevioribus, praecipue differt. Type : *Evrard* 944. Dalat, Annam.

Spikes not densely congested, arising from bracteate nodes :
Spikes on 3 or more main peduncles from each of several nodes of the inflorescence :
Some peduncles branching into 2–6 simple spikes . 57. *javanica.*
Each peduncle bearing only 1 simple spike :
Stems 1–15 cm. tall ; leaves 2 mm. broad ; spikes 10–12 mm. long ; utricles 3 mm. long ; spikes 6–9 on each stem, 2–3 at a node . . . . . 61. *celebica.*
Stems 25–75 cm. tall ; leaves 3–6 mm. broad ; spikes 1·5–5 cm. long ; utricles 4·5–6 mm. long ; spikes usually numerous, 1–20 at a node :
Leaves usually much shorter than the stems ; inflorescence 18–28 cm. long ; bracts mostly not reaching the apex of the inflorescence ; utricles 5·25–6 mm. long, glabrous except on the margins of the beak, which are sparsely hispidulous . . . 62. *hypsophila.*
Leaves often longer than the stems ; inflorescence 10–20 cm. long ; bracts all exceeding, often much exceeding, the apex of the inflorescence ; utricles 4·5–5·5 mm. long, hispidulous on the margins above and on those of the beak . . . 62a. *hypsophila* var. *Havilandii.*
Spikes solitary at each node of the inflorescence :
C. Lower bracts, often all the bracts, completely sheathing the stem (for C′ see p. 11) :
Staminate scales with margins more or less connate in front :
Margins connate for more than halfway up from the base . . . . . 84. *pocilliformis.*
Margins connate for less than halfway up from the base . . . . . 85. *tristachya.*
Staminate scales not connate on the margins :
D. Utricles glabrous, even on the margins of the beak : (For D′. see p. 9) :
Spikes 3–8·5 cm. long ; peduncles bristly on the angles and sides ; pistillate scales sparsely hispidulous ; beak of the utricle inflated at about the middle . . . . . 101. *oedorrhampha.*
Spikes 0·5–4·5 cm. long ; peduncles smooth, or scabrid on the angles ; pistillate scales glabrous ; beak of the utricle not inflated at the middle :
Staminate scales cuneate or oblong-cuneate, with an awn as long as or longer than the rest of the scale . . . . . 102. *Brownii.*
Staminate scales neither cuneate nor oblong-cuneate, when awned the awn shorter, usually very much shorter, than the rest of the scale :
Stigmas 2, stoutish; awn of pistillate scale about 1–2·25 mm. long ; utricles plano-convex, densely whitish-papillose towards the apex 117. *savaiiensis.*

Stigmas 3, slender ; pistillate scales not to very shortly (up to about 1 mm.) mucronate or awned ; utricles more or less trigonous, not whitish-papillose :

Utricles 5·5–7 mm. long, beak more than 1 mm. long ; pistillate scales 3–5 mm. long.

Leaves 4–9 mm. broad ; spikes 5–8 mm. thick when the utricles mature ; utricles 5·75–7 mm. long, strongly multinerved 91. *Jackiana.*

Leaves 2–3 mm. broad ; spikes about 3 mm. thick when the utricles mature ; utricles about 5·5 mm. long, obsoletely nerved 51. *atjehensis.*

Utricles 2·25–2·75 mm. long, beak not more than about ·5 mm. long ; pistillate scales 1·75–2·5 mm. long :

Leaves 2–2·5 mm. broad ; spikes 3–5, uppermost 5–15 mm. long, sometimes gynaecandrous ; pistillate scales 2–2·5 mm. long ; utricles erostrate or subrostrate 110. *elibates.*

Leaves 2–6 mm. broad ; spikes 4–6, uppermost 1–4·5 mm. long, always staminate ; pistillate scales 1·75–2·25 mm. long ; beak of the utricle 0·2–0·3 mm. long :

Leaves much longer than the stems (3–6 mm. broad) ; spikes 5–6 ; pistillate scales usually mucronulate ; utricles strongly nerved . . . . . 108. *neurochlamys.*

Leaves little longer than the stems (2–6 mm. broad) ; spikes 3–5 ; pistillate scales not usually mucronulate ; utricles nerveless to slenderly nerved . . . . . 109. *maculata.*

D′. Utricles sparsely to densely hairy or hispidulous, usually on one or both faces, rarely only on the margins :

Staminate spikes 2–5 :

Leaves 5–7 mm. broad ; staminate spikes 4–5 ; pistillate scales oblong-elliptic, obtuse to bilobed-emarginate at the apex ; utricles 4–4·5 mm. long, with a very oblique mouth . . . . . 104. **chaetogyne.*

Leaves 2–5 mm. broad ; staminate spikes 2–3 ; pistillate scales lanceolate, acuminate ; utricles 3·5–4 mm. long, mouth not oblique . . . . . 105. *fedia.*

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* **Carex chaetogyne** *Nelmes*, sp. nov. ; affinis *C. fediae* Nees, sed foliis latioribus, spicis femineis pluribus, utriculis longioribus ore oblique secto, praecipue differt. Type : *Kerr* 5094. Mû Pung (Mûang Pān), Siam.

Staminate spike 1 :

Pistillate scales 5–9·5 mm. long (including awns) ; utricles inflated and obscurely trigonous ; nut deeply constricted at about the middle :

Leaves 2–6 mm. broad ; spikes up to 5 cm. long ; utricles obovoid or ellipsoid-obovoid, 5–6·5 mm. long, smooth . . . . 90. *wahuensis.*

Leaves 2–3 mm. broad ; spikes up to 3 cm. long ; utricles orbicular-ovoid, about 5 mm. long, rugulose . . . . . 89. *erythrolepis.*

Pistillate scales 1·5–4·5 mm. long (including awns) ; utricles distinctly trigonous and not inflated (except in *C. montivaga*) ; nut not constricted at the middle :

Stems about 60 cm. tall ; leaves numerous but situated only on the upper part of the stem ; pistillate scales 1·5–2 mm. long ; utricles densely hispidulous . . . . 106. *Maubertiana.*

Stems 1–45 cm. tall ; leaves mostly at or near the base of the stem, where they are more or less crowded, and only about 0–2 above ; pistillate scales 2–5 mm. long ; utricles not densely hispidulous (except in *C. tricuspidata*) :

Utricles 5·5–7·25 mm. long :

Stems 10–40 cm. tall ; pistillate scales 3·75–4·25 mm. long ; utricles fusiform, 6·25–7·25 mm. long . . . . 93. *Loheri.*

Stems 3·5–7 cm. tall ; pistillate scales 2·5–3·5 mm. long ; utricles rhomboid-lageniform, 5·5–6 mm. long . . . . . 79. *rhynchachaenium.*

Utricles 2·75–5 mm. long (2·75–4 mm. long, except in *C. breviscapa*, 3·5–5 mm. long) :

Spikes 5–10 mm. long ; nut with a discoid-annulate apex :

Stems 10–20 cm. tall ; leaves 2·5–4 mm. broad ; spikes about 5 and about 5 mm. long ; pistillate scales 2–3 mm. long . . . . . 82. *perciliata.*

Stems 1–10 cm. tall ; leaves 1–2·5 mm. broad ; spikes 2–4, 5–10 mm. long ; pistillate scales 3–5 mm. long . . . . . 83. *montivaga.*

Spikes 1–4·5 cm. long ; nut not discoid-annulate at the apex :

Stems 4–16 cm. tall ; leaves 3–6·25 mm. broad, very much longer than the stems ; lower bracts much longer than the inflorescence ; utricles 3·5–5 mm. long (spikes 1–3 cm. long) . . . . . 78. *breviscapa.*

Stems 17–45 cm. tall ; leaves 1·25–4 mm. broad, mostly shorter to much shorter than the stems ; lower bracts much shorter than the inflorescence ; utricles 3–4 mm. long :

Leaves 2–4 mm. broad ; spikes 5–7, 1–3 cm. long ; pistillate scales 2–3 mm. long, subobtuse to subacute at the apex ; utricles 3–3·5 mm. long, sparsely hispidulous above . . . . . 81. *cambodiensis.**

Leaves 1·25–2·25 mm. broad ; spikes 3–5, 1·5–4·5 cm. long ; pistillate scales 3·5–4·5 mm. long, bilobed-truncate at the apex ; utricles 4 mm. long, densely hispidulous above . . . . . 107. *tricuspidata.*

C′. Lower bracts not, or lowest 1 very shortly, completely sheathing the stem, but often subamplexicaul, and sometimes auricled in front, at the base :

E. Utricles plano-convex or biconvex ; stigmas 2 (for E′ see p. 12) :

Utricles crustaceo-coriaceous, subinflated plano-convex or subinflated biconvex ; style moderately to strongly bent at the base :

Spikes cernuous, 9·5–17 cm. long, subdense- to lax-flowered ; pistillate scales 4–6 mm. long . . . 124. *sandwicensis.*

Spikes straight, 3–6 cm. long, dense-flowered ; pistillate scales 2–4 mm. long . . . . . 125. *crustacea.*†

Utricles membranaceous or subcoriaceous, plano-convex or compressed biconvex, not inflated ; style straight:

Spikes, or at least the lower ones, subcernuous to pendulous ; bract of the lowest spike far exceeding the apex of the inflorescence ; scales mucronate to aristate ; utricles densely whitish- to reddish-papillose :

Staminate spikes up to 3 ; utricles strongly nerved, gradually to subgradually narrowing into the beak, minutely papillose (3·25–3·5 mm. long) 119. *inverso-nervosa.*‡

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* **Carex cambodiensis** *Nelmes*, sp. nov. ; affinis *C. tenuinervi* Ohwi, sed foliis latioribus, spicis pluribus, utriculis longioribus, praecipue differt. Type : *Poilane* 23139. Elephant Mountain, Cambodia.

† **Carex crustacea** *Nelmes*, sp. nov. ; affinis *C. sandwicensi* Boeck., sed spicis strictis brevioribus densifloris, squamis brevioribus, praecipue differt. Type : *Hillebrand* 534 (Herb. Kew.), [sphalm. 533 (Hillebr. Fl. Hawaiian Is.)].

‡ **Carex inverso-nervosa** *Nelmes*, sp. nov. ; affinis *C. tereti* Boott, sed spicis brevioribus crassioribus, utriculis majoribus ferrugineo-papillosis, praecipue differt. Type : *Milne* 175. Isle of Pines, New Caledonia.

Staminate spike 1 ; utricles nerveless to slenderly nerved, abruptly or subabruptly contracted into the beak, distinctly papillose :

Inflorescence about 8–10 cm. long ; spikes 3–6 cm. long, about 4–6 mm. thick when the utricles are mature ; utricles 2·5–3 mm. long, elliptic to suborbicular . . . 122. *phacota.*

Inflorescence about 5 cm. long ; spikes 1·5–3 cm. long, about 5–7 mm. thick when the utricles are mature ; utricles 3–3·5 mm. long, elliptic to ovate-lanceolate . . . 123. *pruinosa.*

Spikes all straight and erect or suberect ; bract of the lowest spike not or slightly exceeding the apex of the inflorescence ; scales not mucronate nor aristate ; utricles densely puncticulate :

Stems 20–50 cm. tall ; leaves shorter to much shorter than the stems ; spikes about 5, lower arising from rather distant nodes ; utricles 2·5–3 mm. long, usually slightly exceeding the scales . . . . . 126. *Gaudichaudiana.*

Stems 5–10 cm. tall ; leaves mostly about as long as, but some longer than, the stems ; spikes 3–4, contiguous ; utricles 2·25–2·5 mm. long, usually exceeded by the scales . . . 127. *lacerans.*

E′. Utricles more or less trigonous ; stigmas 3 :

Stems 15–60 cm. long ; leaves 1·5–4 mm. broad ; spikes 3–5, 1–2·5 cm. long :

Stems 30–60 cm. long ; leaves 2–4 mm. broad ; pistillate scales cupreous ; utricles 4 mm. long 99. *montis-eeka.*

Stems 15–30 cm. long ; leaves 1·5–3 mm. broad ; pistillate scales whitish ; utricles 3–3·5 mm. long . . . . . 98. *subtransversa.*

Stems 45–100 cm. or more tall ; leaves 5–15 mm. broad ; spikes 5–7, 1·5–12 cm. long (3·5–12 cm. long, except in *C. fascicularis*, 1·5–3·5 cm., and in *C. Doniana*, 1·5–4·5 cm., long) :

Utricles hispidulous, 3 mm. long . . 100. *nemostachys.*

Utricles glabrous, 3–5 mm. long :

Beak of the utricle with teeth about 1 mm. long ; pistillate scales, including awn, 4–7 mm. long 95. *fascicularis.*

Beak of the utricle with teeth much shorter than 1 mm. ; pistillate scales, including awn, 2·25–4 mm. long :

Spikes 8–12 cm. long ; scales pale, flushed vinaceous ; utricles 4–5 mm. long, oblong-obovoid, longitudinally rugose . . 103. *olivacea.*

Spikes 2·75–7·5 cm. long ; scales whitish to dirty-white ; utricles 3–4 mm. long, ellipsoid to ellipsoid-lanceolate, smooth :

Spikes 3·5–7·5 cm. long ; pistillate scales 2·25–3 mm. long, oblong-obovate to spathulate, bilobed-emarginate at the apex ; utricles reddish-spotted . 96. *baviensis.*

Spikes 1·5–4·5 cm. long ; pistillate scales 3–4 mm. long, oblong-ovate to oblong-lanceolate, acuminate ; utricles not spotted . . . . . 97. *Doniana.*

A'''. Terminal and most of the other spikes androgynaeceous, i.e. pistillate below and staminate above :

F. Leaves up to 3 cm. or more broad, linear to elliptic :

Flowering stems arising from below and outside the short shoot on which are borne the foliage leaves, which are up to 6·7 cm. broad (broader than in any other known *Carex*) . . . . 1. *Adrienii.*

Flowering stems arising from the centre of a tuft of foliage leaves :

Foliage leaves all radical, broadly linear :

Leaves 1·5–3·6 cm. broad ; pistillate scales 3·5–7·5 mm. long (2–4 mm. long, excluding the awn) . . . 7. *Helferi.*

Leaves 2·7–5 cm. broad ; pistillate scales 6–8 mm. long (5–7 mm. long, excluding the awn) . . . 6. *mapaniifolia.*

Foliage leaves all cauline, elliptic or linear-elliptic :

Leaves hispidulous on all nerves on the under-surface . . . 8. *euprepes.*

Leaves smooth on the under surface except at the apex . . . 10. *cataphyllodes.**

F'. Leaves less than 3 cm. broad, linear, rarely broadly linear :

G. Lower bracts not, or lowest 1 rarely, completely sheathing the stem, but often subamplexicaul and auricled at the base in front, inflorescence at each node often a simple spike and sometimes sessile (for G' see p. 15) :

Spikes several to numerous at each node of the inflorescence :

Spikes several to numerous at each of the numerous nodes of a continuous or little interrupted panicle . . . . . 128. *appressa.*

Spikes up to 4 at each of the few (1–4) nodes of a much interrupted panicle . . . . . 21. *malaccensis.*

Spikes solitary (sometimes binate in *C. philippinensis*) at each node of the inflorescence (lowest 1–2 spikes sometimes compound in *C. divulsa* and *C. Thomsonii*) :

Spikes peduncled, 1–11 cm. long (3–11 cm. long, except in *C. Ramosii*) :

Stems 10–20 cm. tall ; leaves about 3 mm. broad ; spikes 1–3, about 1 cm. long ; utricles subinflated-trigonous, 7 mm. long, long-beaked ; stigmas 3 . . . 88. *Ramosii.*

Stems 20–110 cm. tall ; leaves 5–12 mm. broad ; spikes about 6–27, 3–20 cm. long ; utricles biconvex or compressed-biconvex, less commonly plano-convex,

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* **Carex cataphyllodes** *Nelmes*, sp. nov. ; affinis *C. euprepi* Nelmes, sed foliis angustioribus lineari-ellipticis, nervis subtus laevibus nec adpresso-hispidulis, praecipue differt. Type : *Kerr* 10371. Kao Ri Yai, Kanburi, Siam.

1·75–5 mm. long, erostrate or very shortly beaked ; stigmas 2 :

Pistillate scales 1·5–3 mm. long ; utricles 1·75–4 mm. long ; nut 1·5–1·75 mm. long :

Stems about 20 cm. tall ; leaves about 5 mm. broad ; spikes about 6, about 3 cm. long ; utricles 3–4 mm. long . . . . . 116. *tahitensis*.

Stems 60–110 cm. tall ; leaves 5–12 mm. broad ; spikes 10–27, 3–11 cm. long ; utricles 1·75–3 mm. long :

Pistillate scales about as long as the utricles and 2·25–3 mm. long . . . . . 112. *exploratorum*.

Pistillate scales much shorter than the utricles and 1·5–2 mm. long :

Spikes 10–22, sometimes binate ; utricles 2·5–2·75 mm. long, obovate-elliptic, becoming patent at maturity, margins usually vitreous-hispidulous near the erostrate apex . . . . . 111. *philippinensis*.

Spikes 15–27, single ; utricles 1·75–2·5 mm. long, elliptic, becoming patulous at maturity, margins glabrous :

Leaves about 6–9 mm. broad ; spikes about 15–20, about 4–11 cm. long and 3–4 mm. thick at maturity ; utricles about 1·75–2 mm. long, slenderly multinerved . . . 113. *Graeffeana*.

Leaves about 5–12 mm. broad ; spikes about 16–27, about 3–8·5 cm. long and 4·5–5 mm. thick at maturity ; utricles 2·25–2·5 mm. long, strongly plurinerved . . . 113a. *Graeffeana* var. *samoënsis*.

Pistillate scales 3·5–5 mm. long ; utricles 5 mm. long ; nut 2–2·5 mm. long :

Leaves about 10 mm. broad ; spikes 12, 4–20 cm. long ; pistillate scales 3 5 mm. long . . . . . 114. *Stokesii*.

Leaves about 7 mm. broad ; spikes 6–7, 4–10 cm. long ; pistillate scales 4–5 mm. long . . 115. *feani*.

Spikes sessile, rarely subsessile, 3–11 mm. long (3–8 mm. long, except in *C. Thorelii*, 7–11 mm., and in *C. tricephala*, 8–10 mm., long) :

Stigmas 2 ; utricles plano-convex :

Lower bracts longer than the inflorescence :

Spikes 20 or more ; utricles 2·25–2·75 mm. long . . . 129. *Thomsonii*.

Spikes about 5–10 ; utricles 3·5–4·5 mm. long . . . 130. *nubigena*.

Lower bracts much shorter than the inflorescence :

Inflorescence about 5–17 cm. long ; lower spikes up to 5–6 cm. distant from one another . . . . . 131. *divulsa*.

Inflorescence 1·5–2·5 cm. long ; lower spikes scarcely separated from one another . . . . 132. *Pairaei.*

Stigmas 3 ; utricles more or less trigonous :

Utricles 2·25–2·5 mm. long . . . . . 53. *satsumensis.*

Utricles 4–5 mm. long :

Utricles glabrous except the margins . . . . . 36. *palawanensis.*

Utricles densely hairy :

Leaves 5–11 mm. broad ; lowest bract much longer than the inflorescence . . . 19. *Thorelii.*

Leaves 3–5 mm. broad ; lowest bract about as long as the inflorescence . . . . . 20. *tricephala.*

G′. Lower bracts sheathing, often long-sheathing, the stem ; inflorescence at each node often branched and peduncled :

H. Partial inflorescence, at each node, consisting of a single, peduncled spike :

Stigmas 2 ; utricles plano-convex to biconvex :

Leaves only about half as long as the average stems, 1·5–2·5 mm. broad ; pistillate scales 4·25–6·75 mm. long, aristate . . . . . 74. *longipes.*

Leaves longer than the stems, up to 5·5 mm. broad ; pistillate scales 3·5 mm. long, mucronulate . . . . . 70. *kinabaluensis.*

Stigmas 3 ; utricles trigonous :

Spikes 1–3, the lower or lowest often arising from basal leaf-sheaths ; pistillate scales 2·5–3 mm. long, midrib not excurrent . . . . . 86. *speciosa.*

Spikes 2–7, situated in the upper part of the stem ; pistillate scales 4·5–6·5 mm. long, including the long-excurrent midrib :

Pistillate scales oblong-ovate, obtuse to very obtuse at the apex, wholly glabrous to sparsely hispidulous ; utricles 6–7 mm. long, glabrous to hispidulous on the back . . . . . 63. *borneënsis.*

Pistillate scales ovate-lanceolate to oblong-lanceolate, subacute to obtuse at the apex, sparsely to densely hispidulous ; utricles 7–8 mm. long, subdensely to densely hispidulous . . . . . 63a. *borneënsis* var. *Clemensii.*

H′. Partial inflorescence on 2 or more main penduncles at one or more of the nodes, some of the peduncles bearing 2 to numerous spikes (for H″ see p. 18) :

I. Utricles glabrous except the margins (for I′ see p. 17) :

Stigmas 2 ; utricles plano-convex :

Stems about 35–60 cm. tall ; leaves 2–3·5 mm. broad ; spikes 2–4-fascicled ; utricles broadly elliptic-lanceolate, with strong nerves and a broad, stout beak . . . . . 68. *Meyenii.*

Stems about 70–80 cm. tall ; leaves 1·5–2 mm. broad ; spikes 3–5-fascicled ; utricles narrowly elliptic, with slender nerves and a very slender beak . . . 72. *spathaceo-bracteata.*

Stigmas 3 ; utricles obscurely to distinctly trigonous :
Spikes 2–8 cm., mostly 2·5–6 cm., long :
Leaves about 6 mm. broad ; spikes mostly about 2·5–3·5 cm. long, staminate part usually longer than the pistillate part . . . . . 58. *Gibbsiae.*
Leaves about 4 mm. broad ; spikes mostly about 4–6 cm. long, staminate part usually less than one-third the whole length . . . . . 59. *turrita.*
Spikes 4–17 mm., usually less than 10 mm., long :
Inflorescence 10 cm. long ; leaves up to 3 mm. broad ; utricles nerveless except for 1–2 marginal nerves . . . . . 46. *xestogyne.**
Inflorescence more, usually much more, than 10 cm. long ; leaves 3–13 mm. broad ; utricles slenderly to strongly nerved :
Bracts all much exceeding the apex of the inflorescence ; utricles subinflated, obscurely trigonous, strongly spongy-ribbed (leaves 6–13 mm. broad) . . . . . 24. *cruciata.*
Bracts usually shorter than, but sometimes exceeding, the inflorescence, utricles not inflated, distinctly trigonous, not spongy-ribbed, all except those of *C. breviceps* nerveless or slenderly nerved :
Pistillate scales 3–4 mm. long ; utricles 4–4·5 mm. long :
Leaves 5–12 mm. broad ; secondary panicles about 6–10 ; bracts mostly shorter than the inflorescence ; utricles ellipsoid to obovoid, slenderly multinerved . . . . . 43. *saturata.*
Leaves 4 mm. broad ; secondary panicles 10 to more numerous ; bracts exceeding the inflorescence ; utricles narrowly ellipsoid, scarcely nerved . . . . . 39. *neo-hebridensis.*
Pistillate scales 1·75–2·5 mm. long ; utricles 2·75–3·5 mm. long :
Leaves 3–4 mm. broad ; utricles strongly nerved . . . . . 3. *breviceps.*
Leaves 4–13 mm. broad ; utricles from almost nerveless to slenderly nerved :
Leaves 4–8 mm. broad ; pistillate scales 1·75–2 mm. broad . . . . . 41. *filicina.*
Leaves 7–13 mm. broad ; pistillate scales 2–2·5 mm. broad :
Leaves 7–10 mm. broad ; lower bracts shorter than the inflorescence . . . 29. *semiglomerata.*

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* **Carex xestogyne** *Nelmes*, sp. nov. ; affinis *C. plebeiae* C. B. Clarke, sed spicis brevioribus, utriculis brevioribus enerviis marginibus exceptis glabris, praecipue differt. Type : *Boden Kloss s.n.* Camp XIII–XI, Mt. Carstensz, Dutch New Guinea.

Leaves 10–13 mm. broad ; lower bracts equalling or exceeding the inflorescence . . . . . 38. *Rafflesiana.*

I′. Utricles sparsely to densely hairy or hispidulous on a part of their surface besides the margins :

Stigmas 2 ; utricles plano-convex to biconvex :

Stigmas about as long as the utricles . . . . 69. *brunnea.*

Stigmas at least twice as long as the utricles :

Leaves 1·5–2 mm. broad ; utricles 5 mm. long . . . . 73. *teinogyna.*

Leaves 2–4 mm. broad ; utricles 3·5–4 mm. long . . . 71. *scabriculmis.*

Stigmas 3 ; utricles obscurely to distinctly trigonous :

Flowering stems arising from below and outside the foliage leaves . . . . . 2. *rhizomatosa.*

Flowering stems arising from the centre of the tuft of foliage leaves :

Spikes 1–6 cm. long :

Leaves 2–5 mm. broad ; partial panicles on 1–5 peduncles ; pistillate scales 2·25–2·75 mm. long ; utricles 3–3·75 mm. long . . . . . 60. *Merrillii.*

Leaves 5–14 mm. broad ; partial panicles on 1–3 peduncles ; pistillate scales 3–6 mm. long ; utricles 4·75–9 mm. long :

Leaves 12–14 mm. broad ; utricles 8–9 mm. long 66. *Vansteenisii.*

Leaves 5–12 mm. broad ; utricles 4·75–7 mm. long :

Leaves 9–12 mm. broad :

Leaves all much shorter than the stem, pistillate scales 3·5–4 mm. long . . . 16. *tonkinensis.*

Leaves from shorter to longer than the stem ; pistillate scales 5–6 mm. long . 56. *arridens.*

Leaves 5–8 mm. broad :

Spikes 1–1·5 cm. long ; pistillate scales whitish (3·5–6 mm. long) ; utricles 4·75–6 mm. long, 1·3–1·8 mm. broad 15. *perakensis.*

Spikes 1–4 cm. long ; pistillate scales castaneous except on the margins ; utricles 5–7 mm. long, 1–1·3 mm. broad :

Pistillate scales 5–6 mm. long (3·5–4 mm. long, excluding the awn) (spikes 1·5–4 cm. long ; utricles 6–7 mm. long) 64. *pseudo-rivulorum.*

Pistillate scales 3–4 mm. long (2·25–2·5 mm. long, excluding the awn) (spikes 1–3 cm. long ; utricles 5–6·5 mm. long) . . . . . 65. *breviglumis.*

Spikes 4–12 mm. long (4–8 mm. long, except in *C. gembolensis*) :

Pistillate scales pale brownish-white ; utricles with 2 spongy-thickened nerves on the dorsal face 25. *spongoneura.**

Pistillate scales castaneous, reddish-brown, or fuscous ; utricles not spongy-nerved :

Leaves 2–6 mm. broad ; inflorescence about 10–30 cm. long :

Leaves 2–3 mm. broad ; spikes 5–8 mm. long ; pistillate scales acute at the apex ; utricles 3 mm. long . . . . . 33. *sarawaketensis.*

Leaves 3–6 mm. broad ; spikes 7–12 mm. long ; pistillate scales obtuse to very obtuse at the apex ; utricles 3·5–4·5 mm. long . . . . . 40. *gembolensis.*

Leaves 7–14 mm. or more broad ; inflorescence about 50–100 cm. long :

Utricles 2·75–3 mm. long . . . 38. *Rafflesiana.*

Utricles 3·25–4 mm. long :

Pistillate scales glabrous to sparsely hispidulous ; panicles lax . . . . . 38a. *Rafflesiana* var. *scaberrima.*

Pistillate scales sparsely to densely hispidulous ; panicles dense . . . . . 38b. *Rafflesiana* var. *macrothyrsa*

H″. Partial inflorescences on only 1 main peduncle at each node, but one or more branching into few or many spikes :

J. Utricles from wholly glabrous to hispidulous on the margins (for J′ see p. 20) :

Spikes 2–6 cm. long ; utricles ovoid to globose . . . . . 48. *baccans.*

Spikes 4–22 mm. long ; utricles ellipsoid or oblong-ellipsoid to obovoid :

Spikes 10–22 mm. long ; staminate part of the spike much longer than the pistillate part ; utricles inflated and obscurely trigonous . . . . . 22. *indica.*

Spikes 4–15 mm. long, staminate part of the spike from very much shorter to somewhat longer than the pistillate part ; utricles not inflated but distinctly trigonous (except in *C. Dietrichiae*) :

Leaves 15–25 mm. broad ; utricles transversely rugose . . . . . 12. *blepharolepis.*†

Leaves 4–15 mm. broad ; utricles not rugose :

Pistillate scales about 1·25 mm. long ; utricles 2·5 mm. long . . . . . 42. *sclerioides.*

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* **Carex spongoneura** *Nelmes*, sp. nov. ; affinis *C. cruciatae* Wahlenb., sed inflorescentiis brevioribus oblongis, utriculis magis distincte trigonis, praecipue differt. Type : *Gibbs* 4093. Mt. Kinabalu, British North Borneo.

† **Carex blepharolepis** *Nelmes*, sp. nov. ; affinis *C. spatiosae* Boott, sed squamis femineis brevioribus glabris, utriculis brevioribus, praecipue differt. Type : *Van Steenis* 5457. Priangan, Java.

Pistillate scales 1·5–4·5 mm. long ; utricles 3–4·5 mm. long :

K. Pistillate scales reddish or castaneous or flecked or splashed with one or other of these colours :

Utricles inflated, obscurely trigonous (spikes 5–15 mm. long ; staminate and pistillate parts of the spike usually about equal in length) . . . . . 23. *Dietrichiae.*

Utricles not inflated, distinctly trigonous :

Leaves shorter than the stems, 4–6 mm. broad ; pistillate scales about 2 mm. long . . . . . 32. *neo-guineënsis.*

Leaves longer than the stems, 5–12 mm. broad ; pistillate scales 2–4 mm. long :

Spikes 7–15 mm. long ; pistillate scales wholly dark reddish, 3–4 mm. long (leaves 5–12 mm. broad) . 43. *saturata.*

Spikes 4–10 mm. long ; pistillate scales reddish-flecked or splashed, 2–3 mm. long :

Lower bracts much shorter than the inflorescence : spikes about 5 mm. long ; pistillate scales reddish-flecked ; utricles oblong-ellipsoid, slenderly nerved (leaves 6–10 mm. broad) . . . . . 37. *Clarkeana.*

Lower bracts much longer than the inflorescence ; spikes 4–10 mm. long ; pistillate scales reddish-splashed ; utricles obovoid or ellipsoid-obovoid, strongly nerved (leaves 7–11 mm. broad) . . . . . 27. *lamprochlamys.*

K′. Pistillate scales from milky or dirty white to light brown :

Leaves 8–15 mm. broad :

Leaves 12–15 mm. broad ; inflorescence about 35–40 cm. long . . 28. *Horsfieldii.*

Leaves 8–13 mm. broad ; inflorescence about 3–14 cm. long . . . . 9. *laosensis.*

Leaves 5–8 mm. broad :

Secondary panicles 4–5 ; pistillate scales about 2 mm. long ; utricles wholly glabrous . . . . . 13. *plagiostoma.**

Secondary panicles 5–8 ; pistillate scales 2–3·25 mm. long ; utricles hispidulous or serrulate on the margins of the beak :

Secondary panicles 1·5–3·5 cm. long ; spikes 4–5 mm. long . . 34. *cirrhulosa.*

***Carex plagiostoma** *Nelmes*, sp. nov. ; affinis *C. stramentitiae* Boott ex Boeck., sed spicis brevioribus, squamis femineis minoribus apice bilobo-emarginatis, utriculis apice reflexis, praecipue differt. Type : *Balansa* 2819. Mt. Bavi, Siam.

Secondary panicles 2·5–10 cm. long ; spikes 5–15 mm. long :

Secondary panicles 3·5–7·5 cm. long ; spikes 6–15 mm. long ; pistillate scales brown with a broad whitish margin, distinctly nerved, midrib excurrent in an awn up to 1·5 mm. long . . . . . 26. *fissilis.*

Secondary panicles 2·5–10 cm. long ; spikes 5–10 mm. long ; pistillate scales milky white, nerveless to very slenderly nerved, midrib excurrent in an awn up to 0·5 mm. long . . . . . 30. *galactolepis.**

J′. Utricles more or less hairy or hispidulous on at least a part of their surface besides the margins :

Flowering stems arising from the axils of basal foliage leaves . . . . . 75. *cryptostachys.*

Flowering stems arising from the centre of a tuft of foliage leaves :

Spikes (excluding small lateral ones) 2–7 cm. long ; margins of lower leaf-sheaths splitting into herring-bone-shaped fibres :

Spikes about 15–22 from 8–10 nodes ; pistillate scales sparsely to subdensely hispidulous ; utricles about 3 mm. long, ellipsoid to obovoid, subdensely hispidulous above, beak about 0·5 mm. long . . . . . 49. *composita.*

Spikes about 5–15 from 5–7 nodes ; pistillate scales glabrous ; utricles 4 mm. long to slightly shorter, ellipsoid to ovoid, sparsely hispidulous above, beak about 1 mm. long . . . . 50. *longibracteata.*

Spikes 3–20 mm. long (3–15 mm. long except in *C. phyllocaula*) ; lower sheaths not splitting into herring-bone-shaped fibres, but eventually withering into straight fibres :

L. Leaves 7–25 mm. broad (10–25 mm. broad except in *C. nodiflora*) (for L′ see p. 21) :

Inflorescence 4–8 cm. long ; spikes 8–15 mm. long :

Leaves 12–22 mm. broad ; pistillate scales 3–3·5 mm. long ; utricles 4–5 mm. long . . . 18. *sychnostachya.*

Leaves 10–12 mm. broad ; pistillate scales 5–6 mm. long ; utricles 6·5–8 mm. long . . . 14. *leucostachys.*

Inflorescence 15–35 cm. long ; spikes 5–10 mm. long :

Leaves 17–25 mm. broad ; pistillate scales 2·5–4 mm. long ; utricles 4–6 mm. long, sparsely hispidulous, beak 1·5–3 mm. long :

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* **Carex galactolepis** *Nelmes*, sp. nov. ; affinis *C. vesiculosae* Boott, sed foliis latioribus, utriculis longioribus glabris valde nervosis, praecipue differt. Type : *King's Collector* 1906. Larut, Perak.

Leaves 20–25 mm. broad ; inflorescence about 25 cm. long ; utricles 4–5 mm. long, beak 1·5–2 mm. long ; rhachis and some other parts of the plant strikingly rufo-hispidulous . . . . . 4. *Balansae.*

Leaves 17–20 mm. broad ; inflorescence about 15 cm. long ; utricles 5–6 mm. long, beak 2–3 mm. long ; rhachis and some other parts of the plant whitish-hispidulous 11. *spatiosa.*

Leaves 7–15 mm. broad ; pistillate scales 2·25–2·5 mm. long ; utricles 4 mm. long, densely hispidulous, beak about 1 mm. long :

Pistillate scales conspicuously hispid on the midrib ; utricles 2·75–3 mm. long, sub-inflated and obscurely trigonous, glabrous except on the margins and on several nerves near the apex ; nut 1·75–2 mm. long . . . . . 35. *fuirenoides.*

Pistillate scales not conspicuously hispid on the midrib ; utricles 4 mm. long, distinctly trigonous, sparsely to densely whitish-hispidulous except at the base ; nut 2·25–2·5 mm. long :

Stems 50–70 cm. tall ; inflorescence a compound panicle ; pistillate scales aristate ; utricles rhomboid-ellipsoid 31. *nodiflora.*

Stems 40–50 cm. tall ; inflorescence a little-branched panicle ; pistillate scales mucronulate ; utricles ellipsoid to obovoid-ellipsoid . . . . . 17. *Jeanpertii.*

L′. Leaves 2–6·5 mm. broad :

Spikes 1·5–2 cm. long ; pistillate scales 4·75–8 mm. long ; utricles 5–6 mm. long . . . 67. *phyllocaula.**

Spikes 4–11 mm. long ; pistillate scales 2–3 mm. long ; utricles 3–5·5 mm. long :

Inflorescence 6–8 cm. long ; secondary panicles each consisting of 2–4 simple spikes ; utricles 4·5–5·5 mm. long . . 52. *pycnothyrsos.*

Inflorescence 8–33 cm. long ; secondary panicles each consisting of more numerous branched and simple spikes ; utricles 3–4·25 mm. long :

Peduncles of the secondary panicles hispidulous above ; sheaths densely hispidulous at the mouth ; utricles cuneate-obovoid, densely hispidulous except at the base . . . . . 47. *timorensis.*

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* **Carex phyllocaula** *Nelmes*, sp. nov. ; affinis *C. Vansteenisii* Kükenth., sed foliis angustioribus, inflorescentiis et spicis brevioribus, utriculis brevioribus, praecipue differt. Type : *Kerr* 6615. Doi Chiengdão, Siam.

Penduncles of the secondary panicles, and sheaths, glabrous ; utricles ellipsoid, sparsely hispidulous above, glabrous below:
Leaves shorter than the stems ; pistillate scales 2–3 mm. long ; utricles ellipsoid, 3·75–4·25 mm. long ; nut 2·5 mm. long . . . . . 45. *plebeia.*
Leaves much longer than the stems ; pistillate scales 1·25–2·5 mm. long ; utricles usually oblong-obovoid, 3–3·5 mm. long ; nut 2 mm. long . 44. *continua.*

Some time after this key was completed I heard from Mr. S. T. Blake, of Brisbane, that he had been requested to deal with the *Cyperaceae* collected by L. J. Brass in New Guinea. Among the *Carices* were several new species. Two of these, which Mr. Blake proposed to call *C. lamprochlamys* and *C. montivaga*, seemed identical with two which I had included in my key (with Latin diagnoses), so I suppressed my names in favour of his. He kindly sent me notes of his other species, and scraps of material of some of them, with their proposed names, but I was unable to add these to the key in the absence of fuller descriptions. It is not certain whether Mr. Blake's descriptions will appear before or after this key is published, so I omit mention of his names here.

Enumeration

In the references to literature " C. B. Clarke," standing alone, refers to his List of the Carices of Malaya in Journ. Linn. Soc. **37**, 1904, and " Kükenth." to the latter's monograph in Engl. Pflanzenreich, IV, **20**, 1909.

1. *Carex Adrienii* E. G. Camus in Lecomte, Fl. Gén. Indo-Chine, **7,** 186 (1912) ; Nelmes in Hook. Ic. Pl. t. 3434 (1943).—*C. scaposa* var. *baviensis* Franch. in Nouv. Arch. Mus. Hist. Nat. sér. 3, **8,** 255 (1896) ; C. B. Clarke in Journ. Linn. Soc. **37,** 8 (1904) ; Kükenth. in Engl. Pflanzenreich, IV, **20,** 286 (1909).—Indo-China.

2. *C. rhizomatosa* Steud. in Zoll. Verz. Ind. Archip. 60 (1854) ; C. B. Clarke, 12 ; Kükenth. 289.—*C. oligostachya* Nees ex Hook. in Kew Journ. Bot. **6,** 2 (1854).—*C. Cumingiana* Steud. Synops. Cyper. 206 (1855).—? *C. bukaënsis* Palla in Rechinger, Bot. u. Zool. Ergebn. von den Samoa u. Salomonsinseln. 3 [500] (1913).—Indo-China, Sumatra, Philippines, Sumbawa, N. Guinea, Solomons. (Assam, U. Burma.)

3. *C. breviceps* Kükenth. in Engl. Bot. Jahrb. **69,** 263 (1938).—N. Guinea.

4. *C. Balansae* Franch. in Nouv. Arch. Mus. Hist. Nat. sér. 3, **8,** 258 (1896) ; C. B. Clarke, 11 ; Kükenth. 265.—Indo-China.

5. *C. hypolytroides* Ridl. in Journ. F.M.S. Mus. **8,** 124 (1917).—*C. hypolytroides* Gross et Mattfeld (pro sp. nov.) in Notizbl. Bot. Gart. Berl. **14,** 190 (1938).—Indo-China, Sumatra.

6. *C. mapaniifolia* Ridl. in Journ. F.M.S. Mus. **10,** 124 (1920).—Siam.

7. *C. Helferi* Boeck. in Linnaea, **40,** 365 (1876) ; Kükenth. 286. —L. Burma, Siam.

8. *C. euprepes* Nelmes in Kew Bull. 1939, 305, et in Hook. Ic. Pl. t. 3433 (1943).—Indo-China.

9. *C. laosensis* Nelmes in Kew Bull. 1939, 305.—Indo-China.

10. *C. cataphyllodes* Nelmes (supra, p. 13).—Siam.

11. *C. spatiosa* Boott, Illustr. **2,** 86, t. 246 (1860) ; C. B. Clarke, 12 ; Kükenth. 265.—Indo-China.

12. *C. blepharolepis* Nelmes (supra, p. 18).—*C. spatiosa* var. *bogorensis* C. B. Clarke, 12.—*C. Horsfieldii* Boott, Kükenth, 273, partim.—Java.

13. *C. plagiostoma* Nelmes (supra, p. 19).—*C. stramentitia* Boott ex Boeck., C. B. Clarke, 9, partim ; Kükenth. 265 (" ex Clarke ") partim. —Indo-China.

14. *C. leucostachys* Ridl. in Kew Bull. 1928, 77.—Malay Peninsula.

15. *C. perakensis* C. B. Clarke in Hook. f. Fl. Brit. Ind. **6,** 720 (1894) ; C. B. Clarke, 9.—*C. Wightiana* var. *perakensis* (C. B. Clarke) Kükenth. 288.—Malay Peninsula.

16. *C. tonkinensis* Franch. in Nouv. Arch. Mus. Hist. Nat. sér. 3, **8,** 251 (1896) ; C. B. Clarke, 14 ; Kükenth. 292.—Indo-China, Sumatra.

17. *C. Jeanpertii* E. G. Camus in Lecomte, Not. Syst. **1,** 295 (1910).— Indo-China.

18. *C. sychnostachya* Nelmes in Kew Bull. 1939, 658.—Siam.

19. *C. Thorelii* E. G. Camus in Lecomte, Not. Syst. **1,** 295 (1910, 21 Dec.).—*C. plesiocephala* Turrill in Kew Bull. 1910 (24 Dec.), 385.—Indo-China, Siam. (U. Burma.)

20. *C. tricephala* Boeck. in Flora, **58,** 263 (1875) ; Kükenth. 289.— *C. madoerensis* C. B. Clarke, 15.—Madura.

21. *C. malaccensis* C. B. Clarke in Hook. f. Fl. Brit. Ind. **6,** 722 (1894) ; C. B. Clarke, 9 ; Kükenth. 289.—Malay Peninsula.

22. *C. indica* L. Mant. II, 574 (1771) ; C. B. Clarke, 8 ; Kükenth. 262.—Indo-China, Siam, Malay Peninsula, Java. (Sikkim, Assam, Nicobar Is.)

23. *C. Dietrichiae* Boeck. in Flora, **58,** 122 (1875) ; C. B. Clarke, 8.— *C. indica* var. *fissilis* (Boott) Kükenth., Kükenth. 264, partim.—? Indo-China, Malay Peninsula, Borneo, Philippines, N. Guinea, Solomons, N. Caledonia, Fiji. (Queensland.)

24. *C. cruciata* Wahlenb. in Vet. Akad. Handl. Stockholm, **24,** 149 (1803) ; C. B. Clarke, 9 ; Kükenth. 265.—Indo-China, L. Burma, Malay Peninsula, Borneo, Sumatra. (Himalayas, Assam, China, Japan.)

25. *C. spongoneura* Nelmes (supra, p. 18).—*C. cruciata* Wahlenb., sec. Stapf et Turrill in Journ. Linn. Soc. **42,** 182 (1914), *non* Wahlenb.— Sumatra, Borneo, Philippines.

26. *C. fissilis* Boott, Illustr. **2,** 86, t. 245 (1860).—*C. indica* L. var. *fissilis* (Boott) Kükenth. 264, partim.—N. Caledonia.

27. *C. lamprochlamys* S. T. Blake.—N. Guinea.

28. *C. Horsfieldii* Boott in Proc. Linn. Soc. **1,** 257 (1845) ; C. B. Clarke, 11 ; Kükenth. 273.—*C. spatiosa* var. *bogorensis* C. B. Clarke, Kükenth. 273.—Java.

29. *C. semiglomerata* Kükenth. in Bull. Jard. Bot. Buitenz. sér. 3, **16,** 315 (1940).—Sumatra.

30. *C. galactolepis* Nelmes (supra, p. 20).—*C. repanda* var. *implumis* C. B. Clarke, 9.—? *C. Wightiana* var. *repanda* (C. B. Clarke) Kükenth. 288, partim.—Malay Peninsula, Borneo.

31. *C. nodiflora* Boeck. in Engl. Bot. Jahrb. **5,** 516 (1884) ; Kükenth.

288.—*C. Cumingii* Vidal, Phanerog. Cuming. 156 (1885) ; C. B. Clarke, 11.—Philippines, Sumatra.

32. *C. neo-guineënsis* C. B. Clarke in Journ. Linn. Soc. **37,** 12 (1904) ; Kükenth. 280.—N. Guinea.

33. *C sarawaketensis* Kükenth. in Engl. Bot. Jahrb. **69,** 262 (1938).—N. Guinea.

34. *C. cirrhulosa* Nees in Hook. Kew Journ. Bot. **6,** 29 (1854).—*C. fibrata* Boott apud Vidal, Phanerog. Cuming. 156 (1885).—*C. fuirenoides* Gaudich., C. B. Clarke, 11, partim.—*C. fuirenoides* var. *cirrhulosa* (Nees) Kükenth. 287.— Philippines.

35. *C. fuirenoides* Gaudich, in Freycinet Voy. Bot. 412 (1826) ; C. B. Clarke, 11, partim ; Kükenth. 287.—Marianas : Guam.

36. *C. palawanensis* Kükenth. in Leafl. Philipp. Bot. **4,** 1169 (1911).—Philippines.

37. *C. Clarkeana* Kükenth. in Bull. Herb. Boiss. sér. 2, **4,** 52 (1904) ; Kükenth. 282.—Malay Peninsula.

38. *C. Rafflesiana* Boott in Trans. Linn. Soc. **20,** 132 (1846) ; C. B. Clarke, 10 ; Kükenth. 282.—Sumatra, Java. (? Queensland.)

38a. *C. Rafflesiana* var. *scaberrima* (Boeck.) Kükenth. in Eng. Pflanzenr. IV, **20,** 283 (1909).—*C. scaberrima* C. B. Clarke, 10.—Philippines.

38b. *C. Rafflesiana* var. *macrothyrsa* (Miq.) Kükenth. in Engl. Pflanzenr. IV, **20,** 282 (1909).—*C. macrothyrsa* Miq. Fl. Ind. Bat. **3,** 351 (1855).—Java.

39. *C. neo-hebridensis* Guillaum. et Kükenth. in Bull. Mus. Hist. Nat. Paris, sér. 2, **9,** 304 (1937).—N. Hebrides.

40. *C. gembolensis* C. B. Clarke in Journ. Linn. Soc. **37,** 10 (1904).—? *C. vesiculosa* Boott, Kükenth. 283, partim.—Java, Lombok.

41. *C. filicina* Nees in Wight, Contrib. Bot. Ind. 123 (1834) ; C. B. Clarke, 11 ; Kükenth. 274.—Sumatra, Philippines, Java. (India, Ceylon, China, Japan.)

42. *C. sclerioides* Ridl. in Trans. Linn. Soc. Bot. **9,** 247 (1916).—N. Guinea.

43. *C. saturata* C. B. Clarke in Journ. Linn. Soc. **37,** 12 (1904).—*C. filicina* var. *saturata* (C. B. Clarke) Kükenth. 275.—Borneo.

44. *C. continua* C. B. Clarke in Hook. f. Fl. Brit. Ind. **6,** 717 (1894) ; C. B. Clarke, 11 ; Kükenth. 281.—Philippines, N. Guinea. (Nepal, Sikkim, U. Burma, China.)

45. *C. plebeia* C. B. Clarke in Hook. f. Fl. Brit. Ind. **6,** 718 (1894).—*C. continua* var. *plebeia* (C. B. Clarke) Kükenth. 282.—Siam. (India.)

46. *C. xestogyne* Nelmes (supra, p. 16).—N. Guinea.

47. *C. timorensis* (C. B. Clarke) Nelmes, comb. nov.—*C. gembolensis* var. *timorensis* C. B. Clarke, 10.—?*C. vesiculosa* Boott, Kükenth. 283, partim.—Timor.

48. *C. baccans* Nees in Wight, Contrib. Bot. Ind. 122 (1834) ; C. B. Clarke, 14 ; Kükenth, 258.—*C. curvirostris* Kunze, Suppl. Riedgr. 79, t. 20 (1840–50) ; C. B. Clarke, 14.—Indo-China, Siam, Malay Peninsula, Sumatra, Philippines, Java, N. Guinea. (India, Ceylon, U. Burma, Formosa, S. China, Japan.)

49. *C. composita* Boott, Illustr. **1,** 3, t. 8 (1858) ; Kükenth, 259.—L. Burma. (Bhutan, Assam.)

50. *C. longibracteata* Steud. in Zoll. Verz. Ind. Archip. 60 (1854) ; C. B. Clarke, 15 ; Kükenth. 260.—Sumatra, Java.

51. *C. atjehensis* Kükenth. in Bull. Jard. Bot. Buitenz. sér. 3, **16,** 314 (1940).—Sumatra.

52. *C. pycnothyrsos* Kükenth. in Philipp. Journ. Sci. **6,** 60 (1911).—Philippines.

53. *C. satsumensis* Franch. et Savat. Enum. Pl. Japon. **2,** 132, 558 (no. 2085) (1879) ; Ohwi in Mem. Coll. Sci. Kyoto Imp. Univ. Ser. B, **11,** 458 (1936).—*C. nikoënsis* Franch. et Savat. l.c. 132, 558 (no. 2086) (1879) ; Kükenth. 252.—Philippines. (Japan.)

54. *C. Petelotii* Gross in Notizbl. Bot. Gart. Berl. **14,** 191 (1938).—Indo-China.

55. *C. capillacea* Boott, Illustr. **1,** 44, t. 110 (1858) ; C. B. Clarke, 7.—*C. rara* subsp. *capillacea* (Boott) Kükenth. 102.—Sumatra, Borneo, Philippines, Java, N. Guinea. (India, Japan, China, N.S. Wales.)

56. *C. arridens* C. B. Clarke in Hook. f. Fl. Brit. Ind. **6,** 726 (1894) ; C. B. Clarke, 13 ; Kükenth. 548.—L. Burma, Malay Peninsula.

57. *C. javanica* Boeck. Cyp. Nov. **1,** 43 (1888).—*C. Walkeri* Arn. ex Boott, Kükenth. 546, partim.—Indo-China, Malay Peninsula, Java.

58. *C. Gibbsiae* Rendle in Journ. Linn. Soc. **39,** 180 (1909).—Fiji.

59. *C. turrita* C. B. Clarke in Journ. Linn. Soc. **37,** 13 (1904).—*C. Walkeri* var. *turrita* (C. B. Clarke) Kükenth. 546.—Sumatra, Philippines.

60. *C. Merrillii* Kükenth. in Fedde, Repert. Spec. Nov. **8,** 7 (1910).—Philippines.

61. *C. celebica* Kükenth. in Bull. Jard. Bot. Buitenz. sér. 3, **16,** 318 (1940).—Celebes.

62. *C. hypsophila* Miq. Fl. Ind. Bat. **3,** 354 (1857) ; C. B. Clarke, 13 ; Kükenth. 546.—*C. tartarea* Ridl. in Journ. Bot. **23,** 35 (1885).—*C. sumatrensis* C. B. Clarke, 13.—Sumatra, Java.

62a. *C. hypsophila* var. *Havilandii* (C. B. Clarke) Kükenth. in Engl. Pflanzenr. IV, **20,** 546 (1909).—*C. Havilandii* C. B. Clarke, 13.—Borneo.

63. *C. borneënsis* C. B. Clarke in Journ. Linn. Soc. **37,** 14 (1904) ; Kükenth. in Bull. Jard. Bot. Buitenz. sér. 3, **16,** 320 (1940).—*C. fusiformis* var. *borneënsis* (C. B. Clarke) Kükenth. 598.—Borneo.

63a. *C. borneënsis* var. *Clemensii* (Kükenth.) Kükenth. in Bull. Jard. Bot. Buitenz. sér. 3, **16,** 320 (1940).—*C. Clemensii* Kükenth. in Fedde, Repert. Spec. Nov. **29,** 202 (1931).—Borneo.

64. *C. pseudo-rivulorum* Kükenth. in Bull. Jard. Bot. Buitenz. sér. 3, **16,** 319 (1940).—*C. rivulorum* Ridl. in Journ. F.M.S. Mus. **6,** 195 (1915), *non* Dunn.—Malay Peninsula, Sumatra, Borneo.

65. *C. breviglumis* Ridl. in Fl. Mal. Penins. **5,** 183 (1925).—Malay Peninsula.

66. *C. Vansteenisii* Kükenth. in Bull. Jard. Bot. Buitenz. sér. 3, **16,** 320 (1940).—? Indo-China, Sumatra.

67. *C. phyllocaula* Nelmes (supra, p. 21).—Siam.

68. *C. Meyenii* Nees in Nov. Act. Nat. Cur. **19,** Suppl. i, 123 (1843).—*C. brunnea* var. *Meyenii* (Nees) Kükenth. 601.—Hawaii.

69. *C. brunnea* Thunb. Fl. Japon. 38 (1784) ; C. B. Clarke, 5 ; Kükenth, 599.—Indo-China, Celebes, Philippines, N. Guinea, N. Caledonia. (S. India, Ceylon, Assam, U. Burma, China, Japan, Queensland, Lord Howe Island.)

70. *C. kinabaluensis* Stapf in Journ. Linn. Soc. **42,** 183 (1914).—Borneo.

71. *C. scabriculmis* (Kükenth.) Ohwi in Acta Phytotax. et Geobot. **2,** 27 (1933).—*C. teinogyna* var. *scabriculmis* Kükenth. 602.—Indo-China. (S. Japan, Korea.)

72. *C. spathaceo-bracteata* Kükenth. in Engl. Bot. Jahrb. **70,** 466 (1940).—N. Guinea.

73. *C. teinogyna* Boott, Illustr. **1,** 60, t. 158 (1858) ; Kükenth. 602.—Sumatra, Java. (Assam, U. Burma.)

74. *C. longipes* D. Don in Trans. Linn. Soc. **14,** 329 (1825) ; Kükenth. 603.—Java. (S. India, Himalayas, Assam, China.)

75. *C. cryptostachys* Brongn. in Duperry, Voy. ' Coquille,' Bot. 152, t. 25 (1828) ; C. B. Clarke, 8 ; Kükenth. 471.—Indo-China, Siam, Malay Peninsula, Sumatra, Philippines, Java, Moluccas, N. Guinea. (Hongkong, Formosa, Queensland.)

76. *C. pleurocaula* Nelmes (supra, p. 7).—Indo-China.

77. *C. lageniformis* Nelmes in Kew Bull. 1939, 658.—Siam.

78. *C. breviscapa* C. B. Clarke in Hook. f. Fl. Brit. Ind. **6,** 736 (1894) ; Kükenth. 474.—*C. Curtisii* Ridl. Mat. Fl. Mal. Penins. pt. 3, 117 (1907).—*C. lutchuensis* Ohwi in Mem. Coll. Sci. Kyoto Imp. Univ. Ser. B, **11,** 343 (1936).—Indo-China, Malay Peninsula, Borneo, Philippines, Java. (Ceylon, Formosa, Queensland.)

79. *C. rhynchachaenium* C. B. Clarke ex Merrill in Bull. Dep. Bur. Gov. Labor. Manila, no. 35, 5 (1905) ; Kükenth. 480.—Borneo, Philippines.

80. *C. multifolia* Ohwi in Mem. Coll. Sci. Kyoto Imp. Univ. Ser. B, **5,** 264 (1930).—Philippines. (Japan.)

81. *C. cambodiensis* Nelmes (supra, p. 11).—Indo-China.

82. *C. perciliata* (Kükenth.) Nelmes, comb. nov.—*C. breviculmis* var. *perciliata* Kükenth. 469.—*C. breviculmis* R. Br., C. B. Clarke, 16.—N. Guinea.

83. *C. montivaga* S. T. Blake.—*C. bulbostylis* Kükenth. in Engl. Bot. Jahrb. **69,** 264 (1938), *non* Mackenzie.—Borneo, Philippines.

84. *C. pocilliformis* Boott, Illustr. **4,** 175, t. 593 (1867).—*C. tristachya* var. *pocilliformis* (Boott) Kükenth. 473.—Philippines. (Korea, Formosa, S. Japan.)

85. *C. tristachya* Thunb. Fl. Japon. 38 (1784) ; Kükenth. 471.—Borneo. (China, Japan.)

86. *C. speciosa* Kunth, Enum. Pl. **2,** 504 (1837) ; C. B. Clarke, 14 ; Kükenth. 481.—Indo-China, Siam, Borneo, Java. (India.)

87. *C. Harlandii* Boott, Illustr. **2,** 87, t. 255 (1860) ; Kükenth. 630.—Indo-China, Sumatra, Java. (China.)

88. *C. Ramosii* Kükenth. in Fedde, Repert. Spec. Nov. **8,** 8 (1910).—Philippines.

89. *C. erythrolepis* Kükenth. in Engl. Pflanzenr. IV, **20,** 628 (1909).—Java.

90. *C. wahuensis* C. A. Mey. in Mém. Acad. St. Pétersb. **1,** 218, t.x (1831) ; Kükenth. (as *C. oahuensis*) 631.—? *C. nuptialis* Boott, Illustr. **4,** p. 175, t. 591 (1867).—Hawaii.

91. *C. Jackiana* Boott in Proc. Linn. Soc. **1,** 260 (1848) ; C. B. Clarke, 15 ; Kükenth. 638.—Sumatra, Java. (India.)

92. *C. Elmeri* Kükenth. in Fedde, Repert. Spec. Nov. **8,** 326 (1910).—Sumatra, Philippines.

93. *C. Loheri* C. B. Clarke in Journ. Linn. Soc. **37,** 14 (1904) ; Kükenth. 487.—Philippines.

94. *C. lateralis* Kükenth. in Engl. Pflanzenr. IV, **20,** 639 (1909).—Philippines, Java. (? S. India, ? Ceylon.)

95. *C. fascicularis* Soland. ex Boott in Hook. f. Fl. N.Z. **1,** 283 (1853).—*C. Pseudocyperus* var. *fascicularis* (Soland. ex Boott) Boott, Illustr. **4,** 141 (1867) ; Kükenth. 696.—*C. Pseudocyperus* L., C. B. Clarke, 16, partim.—Java, N. Guinea. (Queensland, N.S. Wales, S. Australia, Tasmania, N. Zealand.)

96. *C. baviensis* Franch. in Nouv. Arch. Mus. Hist. Nat. sér. 3, **10,** 77, t. 8 (1898) ; E. G. Camus in Lecomte, Fl. Gén. Indochine, **7,** 198 (1922).—*C. japonica* var. *chlorostachys* (Don) Kükenth., Kükenth. 620, partim.—Indo-China.

97. *C. Doniana* Spreng. Syst. **3,** 825 (1826).—*C. chlorostachys* D. Don in Trans. Linn. Soc. **14,** 330 (1825), *non* Steven.—*C. japonica* var. *chlorostachys* (Don) Kükenth. 620, partim.—Philippines, Java, N. Guinea. (Sikkim, Assam, China, Japan.)

98. *C. subtransversa* C. B. Clarke in Philipp. Journ. Sci. **2,** 108 (1907) ; Kükenth. 614.—Philippines, N. Guinea. (Japan.)

99. *C. montis-eeka* Hillebrand, Fl. Hawaiian Is. 486 (1888) ; Kükenth. 666.—Hawaii.

100. *C. nemostachys* Steud. in Flora, **29,** 23 (1846) ; Kükenth. 615.—Siam. (Assam, U. Burma, China, S. Japan.)

101. *C. oedorrhampha* Nelmes in Kew Bull. 1939, 659.—*C. tumida* Boott, Illustr. **1,** 66, t. 150 (1858) ; C. B. Clarke, 16 ; Kükenth. 615 ; *non* Beilschm.—Indo-China, Siam, Sumatra, Java. (Sikkim, Assam, Yunnan.)

102. *C. Brownii* Tuckerm. Enum. Meth. 21 (1843) ; Kükenth. 612.—N. Guinea. (Korea, Japan, N.S. Wales, Victoria.)

103. *C. olivacea* Boott in Proc. Linn. Soc. **1,** 286 (1846) ; C. B. Clarke, 15 ; Kükenth. 617.—? Indo-China, Sumatra, Java, Moluccas. (Sikkim, Assam, Japan.)

104. *C. chaetogyne* Nelmes (supra, p. 9).—Siam.

105. *C. fedia* Nees in Wight, Contrib. Bot. Ind. 129 (1834) ; Krecz. in Komarov, Fl. SSSR. **3,** 417 (1935).—*C. Wallichiana* Prescott in Wall. List Pl. E. Ind. Comp. Mus. 118 (1828), *nomen ;* Nees in Wight, Contrib. Bot. Ind. 129 (1834) ; C. B. Clarke 16 ; Kükenth. 749 ; *non* Spreng.—Indo-China, L. Burma. (Afghanistan, Himalayas, Assam, U. Burma, China).

106. *C. Maubertiana* Boott, Illustr. **1,** 45, t. 114 (1858).—*C. hebecarpa* var. *Maubertiana* (Boott) Franch. in Nouv. Arch. Mus. Hist. Nat. sér. 3, **10,** 70 (1898) ; Kükenth. 745.—Indo-China, Sumatra. (Nepal, Sikkim, Assam, China.)

107. *C. tricuspidata* Kükenth. in Engl. Bot. Jahrb. **70,** 466 (1940).—N. Guinea.

108. *C. neurochlamys* F. Muell. Fragm. **8,** 258 (1874).—*C. maculata* var. *neurochlamys* (F. Muell.) Kükenth. 428.—N. Caledonia, Samoa. (Queensland, N.S. Wales.)

109. *C. maculata* Boott in Trans. Linn. Soc. **20,** 128 (1846) ; Kükenth. 427.—Sumatra, Java. (S. India, Ceylon, Assam, Formosa, China, Japan.)

110. *C. elibates* Nelmes in Kew Bull. 1937, 353.—Malay Peninsula.

111. *C. philippinensis* Nelmes in Kew Bull. 1938, 109.—*C. Graeffeana* Boeck., C. B. Clarke, 5, partim ; Kükenth. 403, partim.—Philippines.

112. *C. exploratorum* Nelmes in Kew Bull. 1938, 108.—Borneo.

113. *C. Graeffeana* Boeck. in Flora, **58,** 123 (1875).—Fiji.

113a. *C. Graeffeana* var. *samoënsis* Nelmes in Kew Bull. 1938, 110.—? *C. Rechingeri* Palla in Oesterr. Bot. Zeitschr. **57,** 424 (1907).—Samoa.

114. *C. Stokesii* F. Brown in Bull. Bishop Mus., Honolulu, No. 84, 116 (1931).—Austral Is. : Rapa.

115. *C. feani* F. Brown in Bull. Bishop Mus., Honolulu, No. 84, 115 (1931).—Marquesas : Hivaoa.

116. *C. tahitensis* F. Brown in Occas. Papers, Bishop Mus., Honolulu, **9,** No. 4, 8 (1930).—Society Is. : Tahiti.

117. *C. savaiiensis* Kükenth. in Bull. Bishop Mus., Honolulu, No. 128, 24 (1935).—Samoa.

118. *C. Kerrii* Nelmes in Kew Bull. 1939, 304.—Indo-China.

119. *C. inverso-nervosa* Nelmes (supra, p. 11).—N. Caledonia.

120. *C. teres* Boott var. *spathulata* Kükenth. in Bull. Jard. Bot. Buitenz. sér. 3, **16,** 316 (1940).—Sumatra, Java.

121. *C. dimorpholepis* Steud. Synops. **2,** 214 (1855).—*C. cernua* Boott, Illustr. **4,** 171, t. 578 (1867) ; C. B. Clarke, 6 ; Kükenth. 353.—Indo-China. (Kashmir, Assam, Burma, China, Japan.)

122. *C. phacota* Spreng. Syst. **3,** 826 (1826) ; C. B. Clarke, 6 (sphalm. *C. phacodes*) ; Kükenth. 350.—L. Burma, Sumatra, Philippines, Java, N. Guinea. (Himalayas, S. India, Ceylon, Assam, U. Burma, Japan.)

123. *C. pruinosa* Boott in Proc. Linn. Soc. **1,** 255 (1845) ; C. B. Clarke, 7 ; Kükenth. 352.—Java, Moluccas. (Assam.)

124. *C. sandwicensis* Boeck. in Flora, **58,** 265 (1875) ; Kükenth. 366, partim.—Hawaii.

125. *C. crustacea* Nelmes (supra, p. 11).—*C. sandwicensis* Boeck., Kükenth. 366, partim.—Hawaii.

126. *C. Gaudichaudiana* Kunth, Enum. Pl. **2,** 417 (1837) ; C. B. Clarke, 6 ; Kükenth. 312.—*C. vulgaris* var. *Gaudichaudiana* (Kunth) Boott, Illustr. **4,** 169, t. 567 (1867).—N. Guinea. (Queensland, N.S. Wales, Victoria, S. Australia, Tasmania, N. Zealand.)

127. *C. lacerans* Kükenth. in Engl. Pflanzenr. IV, **20,** 326 (1909).—N. Guinea.

128. *C. appressa* R. Br. Prodr. Fl. N. Holl. 242 (1810) ; Kükenth. 178.—N. Guinea, N. Caledonia. (Queensland, N.S. Wales, Victoria, S. Australia, W. Australia, Tasmania, N. Zealand.)

129. *C. Thomsonii* Boott, Illustr. **1,** 1, t. 1 (1858) ; C. B. Clarke, 5 ; Kükenth. 143.—Indo-China. (Himalayas, Assam, China.)

130. *C. nubigena* D. Don in Trans. Linn. Soc. **14,** 326 (1825) ; C. B. Clarke, 5 ; Kükenth. 145.—*C. fallax* Steud. in Zoll. Verz. Ind. Archip. **1,** 60 (1854).—*C. nubigena* var. *fallax* (Steud.) C. B. Clarke, 5 ; Kükenth. 146.—Sumatra, Java. (Afghanistan, Himalayas, S. India, Ceylon, China.)

131. *C. divulsa* Stokes in With. Bot. Arrang. Brit. Pl. ed. 2, **2,** 1035 (1787) ; Kükenth. 162.—Java. (Europe, W. Asia, N. Africa, Madeira, Canary Is., Azores.)

132. *C. Pairaei* F. Schultz in Flora, **51,** 302 (1868).—*C. echinata* Murr., Kükenth. 160.—Java. (Europe, W. Asia, Madeira.)

133. *C. flaviceps* Kükenth. in Engl. Pflanzenr. IV, **20,** 133 (1909).—Hawaii.

134. *C. craspedotricha* Nelmes in Kew Bull. 1939, 657.—Siam. (China).

135. *C. alta* Boott in Proc. Linn. Soc. **1,** 254 (1845) ; C. B. Clarke, 6.—*C. remota* subsp. *alta* (Boott) Kükenth. 234.—*C. brizopyrum* Kunze, Suppl. Riedgr. 168, t.43 (1840–50).—*C. remota* subsp. *alta* var. *brizopyrum* (Kunze) Boeck. in Linnaea, **39,** 126 (1875) ; Kükenth. 234.—Sumatra, Java. (Himalayas, China.)

136. *C. Rochebrunii* Franch. et Savat. Enum. Pl. Japon. **2,** 126, 555 (1879).—*C. remota* subsp. *Rochebrunii* (Franch. et Savat.) Kükenth. 234, partim.—Sumatra. (China, Japan.)

137. *C. curta* Gooden. in Trans. Linn. Soc. **2,** 145 (1794).—*C. canescens* Linn., Kükenth. 216.—N. Guinea. (Europe, Asia, America, Australia.)

138. *C. pachystachya* Cham. ex Steud. Synops. Cyper. 197 (1855).—*C. macloviana* D'Urv., Kükenth. 195.—Hawaii. (W.N. America, Alaska, Aleutian Is.)

GOMPHRENA CELOSIOIDES MART., A WEED SPREADING IN THE OLD WORLD TROPICS.

N. Y. Sandwith.

A weedy species of *Gomphrena* with oblong or ovoid white heads, which become narrowly cylindric as the lower flowers fall, has been introduced from America into Africa, Asia and Australia, and is spreading rapidly in grass and on roadsides. Specimens have usually been identified as *G. decumbens* Jacq. or, more recently, as *G. dispersa* Standley, species which have been clearly defined by Standley in Contr. U.S. Nat. Herb. xviii. 91–92 (1916) and N. Amer. Fl. xxi, 147–150 (1917). A re-examination of the material, and of a specimen from Java, where the plant is " wild " all over the Botanic Garden at Buitenzorg, showed that this *Gomphrena* can be referred neither to *G. decumbens* nor to *G. dispersa* but is *G. celosioides* Mart., a species of S. Brazil, Paraguay, Uruguay and Argentina. This conclusion is confirmed by the identification of numerous South African specimens of the same plant with *G. celosioides* by Dr. K. Suessenguth, see Fedde Rep. Spp. Nov. XXXV. 309 (1934). One of the collections cited (in error, as "2796") by Suessenguth, *Schlechter* 2769, from Durban, is represented in the Kew Herbarium. Since Martius' type material (coll. *Sellow*) is in the Munich Herbarium, where Dr. Suessenguth is Conservator, there can be little doubt of the accuracy of this identification, apart from the evidence of the description and figure given by M. Seubert in Mart. Fl. Bras. V. pars i, 218, t.66 (1875), and the presence at Kew of specimens collected by Sellow.

G. celosioides Mart. is immediately distinguished from both *G. decumbens* Jacq. and *G. dispersa* Standl. by the very narrow, often obscure, and entire or scarcely toothed crest on the keel of the bracteoles, which is broadest and appears to rise at some distance below the sharply acute apex. Moreover, *G. decumbens*—beautifully figured by Jacquin in Hort. Schoenbr., t. 482 (1804)—differs in having the bracteoles often tinged with pink, and much longer than the flowers ; while *G. dispersa* has the conspicuous crests of the bracteoles widest at or near the apex so that the flowers have an obtuse facies. Each of these species has a more northern distribution in tropical America, mainly in Mexico and Central America, and around the Caribbean Sea.

Old World specimens of *G. celosioides* have been seen from India (Dehra Dun, *Parker ;* Madras, " spreading rapidly as a roadside weed," *Gamble* 12032) ; Java (Buitenzorg, *van Steenis*) ; Australia (Queensland, *Everist* 350, *Hubbard* 6520 ; New South Wales, *Millard*) ; Tropical Africa (many specimens from the Belgian Congo, Uganda, Kenya, Tanganyika, Zanzibar, Portuguese East Africa, Rhodesia) ; South Africa (specimens from Transvaal, Natal) ;. South West Africa (*Dinter* 8002).

An obvious synonym of this plant is *Gomphrena alba* Peter in Fedde, Beihefte, Band XL, 2, Anhang p. 64, t.32 f.2, which was described from specimens collected in Tanganyika.

The plant provisionally identified as *G. decumbens* Jacq. in Gamble, Fl. Madras, part vii, 1179 (1925) is *G. celosioides ;* while the *G. decumbens* Jacq. var. *genuina* Stuchlik of Burtt Davy, Man. Fl. Pl. and Ferns of Transvaal, part i, 185, f.20 (1926), is also this species, as is the *G. globosa* L. ssp. *africana* Stuchlik of Beih. zum Bot. Zentralblatt, XXX. Abt. 2, p. 396 (1913). The reduction of the latter name was duly made by Suessenguth (l.c.). There can be no possibility of confusion of *G. celosioides* with the garden favourite and cosmopolitan weed *G. globosa* L., " Globe Amaranth " or " Bachelor's Button," which has wider, globose, variously coloured heads.

REVIEW

Plants and Plant Science in Latin America.—An extremely interesting volume* of papers in English, French, or Spanish, by various authors, partly published here for the first time and partly re-printed from *Chronica Botanica*, has been edited by Dr. F. Verdoorn. The very nature of the work makes an adequate review impossible in a short space. An introductory essay by the editor raises many questions regarding the status of the botanist in the world in general and in America in particular. Bibliographical references will be of considerable value to anyone working on the flora or vegetation of Latin America. Problems of Tropical American Agriculture and economic plants are outlined. A valuable phytogeographic sketch of Latin America by A. C. Smith and I. M. Johnston is accompanied by an outline map and illustrated by a series of reproductions mostly from published works.

Most of the papers deal with the vegetation and/or flora of more restricted areas. Thus there are accounts of the plant life of Honduras, El Salvador, Nicaragua, Costa Rica, the Panamas, Cuba, Jamaica, Hispaniola, Puerto Rica, the Lesser Antilles, Trinidad and Tobago, Venezuela, British Guiana, Surinam, Brazil, Peru, Paraguay, Argentina, Uruguay, Chile, Galapagos Is., Juan Fernandez and Desventuradas Is., Guatemala, Ecuador, Colombia, Bolivia, and the Falkland Is. There are also accounts of the climate, geology, soils, pathology, economic crops, forestry, ethnobotany, palaeobotany, and cytogenetics of Central and South America or of their native and cultivated plants. A list of the location of botanical collections, arranged according to countries, and a supplement of plant science institutions, stations, museums, gardens, societies, and commissions in Central and South America will be of great use for reference.

W. B. Turrill.

* " Plants and Plant Science in Latin America." Edited by F. Verdoorn, Chronica Botanica Company, Waltham, Mass, U.S.A., 1945, pp. 384, $6.

ADDITIONS TO THE FLORA OF BORNEO AND OTHER MALAY ISLANDS : XIX*.

H. N. Ridley.

Melastomataceae

Anplectrum monticola *Ridley*, sp. nov., nulli speciei arcte affinis, foliis parvis coriaceis retusis rigide coriaceis, paniculis brevibus in axillis superioribus sitis ab omnibus differt.

Frutex, ramis lignosis vix 3 mm. crassis purpureis pilis furfuraceis atris tectis, internodiis 5 mm. longis. *Folia* approximata, coriacea, elliptica, apicibus retusis, basibus cuneatis, glabra, subtus pallidiora, 1–1·5 cm. longa, 5–7 mm. lata, nervis 2 subtus cum costa elevatis ; petioli 3 mm. longi, furfuracei. *Paniculae* axillares, furfuraceae, 2 cm. longae, pendunculis 1 cm. longis. *Flores* 5 vel 6, in apicibus subumbellati. *Bracteae* oblongae, obtusae, 5 mm. longae. *Pedicelli* 3 mm. longi. *Calyx* urceolatus, 3 mm. longus, furfuraceus, margine sinuato. *Petala* 4, lanceolata, acuminata, 3 mm. longa. *Stamina* 8, inaequalia, antheris oblongis, appendicibus basalibus pallidis. *Stylus* longior, cylindricus. *Bacca* globosa, pustulata.

Sarawak. Summit of Benkaran, *C. J. Brooks* 50.

This very curious plant is quite unlike any other species in its densely set, small, coriaceous leaves and short axillary panicles. The young parts are covered with sooty scurfy processes and the young leaves gland-dotted beneath.

Anplectrum macrophyllum *Ridley*, sp. nov., ab *A. latifolio* Triana et *A. Beccariano* Cogn., quibus affine, foliis chartaceis cum tota planta omnino glabris differt.

Frutex scandens, glaber. *Folia* chartacea, ovata, acuminata, basi cordata, 15–17 cm. longa, 11–13 cm. lata, nervis subtus elevatis 3-jugis, nervis transversis dissitis subtus elevatis, marginibus sinuatis sparse denticulatis ; petioli 1·5 cm. longi. *Panicula* terminalis, 30 cm. longa, pedunculo 10 cm. longo, ramis dissitis oppositis 3–7 cm. longis. *Bracteolae* ovatae, acutae, 1 mm. longae. *Pedicelli* 5 mm. longi, scabridi. *Calyx* urceolatus, scabridus, 5 mm. longus, 3 mm. latus, limbo sinuato sub-4-lobo. *Petala* 4, rotundata, late ovata, 5 mm. longa, 5 mm. lata. *Stamina* longe acuminata, 4 exteriora 1 cm. longa, tuberculis minutis dorsalibus instructa, 4 interiora 7 mm. longa, subsimilia. *Stylus* validulus, 1·5 cm. longus.

Sarawak. Pata river, *Hose* 478.

This is allied to *A. latifolium* Triana but has much thinner leaves and is altogether glabrous.

Anplectrum cyanocarpum *Bl.*

Sarawak. Sarawak river at Pengkulu Ampat, edge of old jungle, *Haviland* 69. " Climber or straggler. Petals pale pink."

* Continued from K.B. 1940, 262.

This plant has been found also by *C. B. Kloss* in Pulau Tiuman, an island off the east coast of Johor. Hitherto it has only been recorded from Java.

Anplectrum lepidoto-setosum *King*.

Sarawak. Limbang, berry blue, *Haviland* 544 ; Matang, *Ridley* 12253.

New record for Borneo.

Dissochaeta porphyrocarpa *Ridley*, sp. nov., a *D. hirsuta* Hook. fil., cui affinis, bracteis spathulatis angustis, floribus roseis, filamentis longioribus, stylo longiore uncato, baccis majoribus differt.

Frutex scandens, ramis dense setosis, setis brevibus rigidis sursum curvatis. *Folia* ovata vel lanceolata, subcoriacea, superne setosa, acuminata, obtusa, basibus subcordatis, subtus dense setosa, 11–12 cm. longa, 3·3–6·3 cm. lata, costa et nervis subtus elevatis parallelis subremotis saepe anastomosantibus ; petioli 5 mm.–1 cm. longi, dense setosi. *Panicula* terminalis, 12–14 cm. longa, erecta, setosa, ramis paucis 6 cm. longis. *Bracteae* elongatae, anguste spathulatae, 7 mm. longae, superne 1 mm. latae. *Pedicelli* 4 mm. longi, setosi. *Calyx* urceolatus, setosus, 7 mm. longus, lobis 4 lanceolatis acuminatis extra setosis. *Petala* 4, rosea, triangulari-ovata, bisetosa, 5 mm. longa. *Stamina* 8, longiora filamentis 3 mm. longis antheris cylindricis acuminatis sigmoideis 7 mm. longis, minora filamentis brevioribus antheris paullo minoribus praedita. *Stylus* 1·2 cm. longus, superne incrassatus, curvus, apice uncato. *Bacca* urceolato-ovoidea, setosa, 1·5 cm. longa.

Brit. N. Borneo. Ulu Tawaran, 2,000 ft. alt., young jungle, petals pink, *Haviland* 1287 ; Tampassuk, near Kiau, 3,500 ft. alt., fruits purple, *Haviland* 1288.

This plant was referred by Stapf (in Trans. Linn. Soc. Bot. **4**, 159) to *D. hirsuta* Hook. fil., which was based on a plant, collected by *Motley* in Labuan, of which at that time the flowers were unknown. It is undoubtedly allied to that species, but is very distinct not only in the large flowers and fruits and the pink petals but in the long filaments, narrow spathulate bracts and long hooked style.

Dissochaeta densiflora *Ridley*, sp. nov., *D. annulatae* Hook. fil. affinis, floribus plus dimidio minoribus differt.

Frutex scandens, pilis stellatis ferrugineis setis atris mixtis dense tectus. *Folia* coriacea, superne glabra, subtus pilis stellatis tecta, ovata vel ovato-lanceolata, breviter obtuse acuminata, basibus rotundatis subcordatis, 5–8 cm. longa, 3–4·5 cm. lata, nervis supra immersis subtus elevatis 3-jugis ; petioli pilis stellatis dense tecti, 5 mm. longi. *Panicula* terminalis, densa, multiflora, 10 cm. longa (pedunculo 5 cm. longo), ramis 2 cm. longis approximatis, pilis stellatis pallidis dense tecta. *Bracteae* oblongae, pilosae, setis atris marginatae, 2 mm. longae. *Pedicelli* brevissimi. *Calyx* urceolaris, superne angustatus, pilis pallidis stellatis dense tectus, lobis 4 ovatis obtusis setis atris terminatis, 4 mm. longus. *Petala* 4, lanceolata, acuminata, rosea, seta atra terminata. *Stamina* 8 : 4 linearia, longe acuminata, appendice basali flava bifurcata ; 4 subsimilia breviora, mutica. *Stylus* filiformis, 4 mm. longus, apice ovarii hirto.

Sarawak. Saribas, *Haviland* 1550.

Dalenia furfuracea *Ridley*, sp. nov., a *D. speciosa* Korth., cui affinis, planta tota ferrugineo-furfuracea, foliis oblongis vel elliptico-ovatis, panicula majore patula, staminibus minoribus appendiculatis majoribus muticis differt.

Frutex scandens, gracilis, ferrugineo-furfuraceus, ramis 4-angulatis. *Folia* coriacea, superne costa depressa excepta glabra, subtus ferrugineo-furfuracea, elliptico-ovata vel oblonga, cuspidata, basibus rotundatis, 15 cm. longa, 7–11 cm. lata, nervis 3-jugis valde elevatis, nervis transversis elevatis parallelis, reticulationibus elevatis ; petioli crassi, torti, ferrugineo-furfuracei, 2 cm. longi. *Stipulae* lobatae, 5 mm. longae. *Paniculae* oppositae, axillares, 15 cm. longae, ramis 4–6 cm. longis oppositis, ramulis 1–2 cm. longis oppositis, omnino ferrugineo-furfuraceae. *Pedicelli* 6 mm. longi. *Flores* penduli. *Calyx* basi ovoideo-globosus, 6 mm. longus, limbo cylindrico deciduo 5 mm. longo, furfuraceus. *Petala* 4, lanceolata, acuminata, rosea. *Stamina* 8 : 4 cum filamentis crassiusculis antheris oblongo-linearibus exappendiculatis, 4 alternis brevioribus antheris lanceolatis processubus anticis basalibus lanceolatis apicibus filiformibus. *Stylus* breviusculus, crassiusculus.

Sarawak. Pengkulu Ampat, in old jungle, petals pink, *Haviland* 144 ; Matang, *Ridley* 12259.

That this plant is a *Dalenia* I have no doubt, as the upper part of the calyx is deciduous, but the stamens are not quite similar to those of *D. speciosa* Korth. as figured by the author, the larger series having no appendages, while the smaller ones have narrow lanceolate processes passing into filiform tips. What I take to be Korthals' *D. speciosa* is a " straggling shrub, berries blue " collected by *Haviland* at Rejang Kapit, but I have seen no flowers of it.

Phaulanthus acuminatissimus *Ridley*, sp. nov., a *Ph. pedunculato* Craib, cui affinis, caule subherbaceo, foliis majoribus longe acuminatis differt.

Suffrutex, caule lenticellato. *Folia* herbacea, opposita, ovato-lanceolata, longe acuminata, basibus obtusis, superne pustulata, 17–21 cm. longa (acumine 1–3 cm. longo), 6·3–9 cm. lata, nervis 3-jugis, jugis 2 basalibus jugo 1 in costa decurrente, nervulis transversis pluribus, reticulationibus laxis ; petioli 4·5–5·5 cm. longi. *Racemi* axillares, 5 mm. longi, setis paucis tecti. *Flores* parvi, 3 vel 4, subsessiles, axillares. *Calyx* urceolaris, 2 mm. longus, squamis acutis tectus, lobis 4 cylindricis subacutis glabris 1 mm. longis. *Petala* 4, brevia, lanceolata, acuminata. *Stamina* 8, subaequalia, subsimilia, antheris cylindricis acuminatis appendice minuta dorsali, filamentis linearibus. *Stylus* brevis, cylindricus. *Ovarium* 8-angulatum. *Bacca* 3 mm. longa, squamata.

Sarawak. Mt. Trekan, 1,000 ft. alt., *Hose* 640.

This species is chiefly conspicuous for its very long-acuminate leaves. It is more glabrous than most species of the genus, but has the elongated scale-like trichomes on the inflorescence possessed by other species.

Blastus hispidissimus *Ridley*, sp. nov., a *B. Cogniauxii* Stapf indumento diverso, petalis acuminatis, calyce campanulato, ovario hirto differt.

Fruticulus omnino hirtus, ramis gracillimis. *Folia* inaequalia, herbacea, undique setoso-hirta, ovato-lanceolata, acuminata, basibus inaequila-

teralibus lobis rotundatis, 12 cm. longa, 4 cm. lata, minora 2–7·5 cm. longa, 5 mm.–2 cm. lata, nervis 7, nervulis transversis horizontalibus remotis ; petioli 2 mm. longi, hirti. *Cymae* hirtae, axillares, pedunculis gracilibus 3·5 cm. longis. *Flores* parvi, per 4–7 in apicibus pedicellorum 1 cm. longorum subumbellati. *Bracteae* binae, minutae. *Calyx* campanulatus, longe hirtus, 2 mm. longus, lobis 4 dentiformibus. *Petala* 4, lanceolata, acuminata. *Stamina* 4, antheris oblongo-linearibus obtusis quam filamenta longioribus. *Ovarium* globosum, hirtum. *Stylus* glaber.

Sarawak. Entoyut river, *Hose* 161.

Driessenia hirta *Ridley*, sp. nov., a *D. crystallina* Stapf, cui affinis, foliis sessilibus marginibus sinuatis, paniculis hirtis differt.

Herba gracilis, hirta. *Folia* herbacea, superne setis paucis exceptis glabra, subtus in nervis puberula et setifera, sessilia, inaequalia, late lanceolata, longe acuminata, basibus rotundatis, marginibus sinuatis, majora 15–18 cm. longa, 4·5–8 cm. lata, 7-nervia, minora 5·5–8 cm. longa, 2–3 cm. lata, 5-nervia. *Paniculae* hirtae, axillares, furfuraceae, 5 cm. longae. *Pedicelli* 1 mm. longi. *Calyx* campanulatus, hirtus, 3 mm. longus, lobis minutis dentiformibus. *Petala* 4, minuta, oblonga. *Stamina* 8, filamentis filiformibus, antheris lineari-oblongis acuminatis curvis 2 mm. longis, appendicibus bifurcatis 1 mm. longis. *Stylus* breviusculus, filiformis. *Capsula* ovoidea, 2 mm. longa.

Sarawak. Rejang, Belaga, *Haviland* 3140.

This is perhaps most nearly allied to *D. crystallina* Stapf, but the general hairiness and the almost or quite sessile leaves distinguish it at once.

Anerincleistus ovatus *Ridley*, sp. nov., ab *A. glomerulato* King, cui affinis, foliis multo majoribus ovatis basi rotundatis, paniculis laxioribus differt.

Frutex, ramis setis appressis tectis. *Folia* herbacea, superne setis paucis dissitis exceptis glabra, subtus pallida, setosa, costa nervisque densissime tectis, ovata, acuminata, acuta, basibus rotundatis vel obtusis, 18–21 cm. longa, 10–12 cm. lata, nervis 3-jugis, jugis 2 e basi, jugo 1 e costa exortis ; petioli densissime setosi, 5–9·5 cm. longi. *Paniculae* subterminales, 15 cm. longae, pedunculo dense setoso, ramis paucis brevibus suboppositis 0·5–1 cm. longis, floribus congestis. *Bracteae* lanceolatae, densissime setosae, caducae, 3 mm. longae. *Pedicelli* vix 1 mm. longi. *Calyx* campanulatus, scabrido-setosus, 2 mm. longus, lobis 4 brevissimis obtusis. *Petala* 4, ovata, obtusa, minuta. *Stamina* 8, filamentis filiformibus 1 mm. longis, antheris oblongis obtusis rubris 2 mm. longis. *Stylus* filiformis, crassiusculus, sigmoideus. *Capsula* campanulata, lobis oblongo-quadratis truncatis.

Sarawak. Mt. Matang, 2,000 ft. alt., *Haviland* 38 (type) ; Po Point, *Haviland* 1908 ; Limbang, *Hose* 745 ; Mt. Trekan, 2,000 ft. alt., *Hose* 745.

This is allied to *A. glomerulatus* King, but has very much larger leaves, ovate in shape.

The species included under the genus *Anerincleistus* by Cogniaux and King, *A. glomerulatus*, *A. Beccarii* Cogn., *A. monticola* Sm., are much more like *Allomorphia* than like *An. hirsutus* Korth., the generic type, differing indeed mainly in the inappendiculate stamens. The inflorescence is practically terminal in all.

Sonerila begoniifolia *Bl.*

Dutch Borneo. S. and E. Division : Banjermasin, on shady wet rocks, *Motley* 1111. New record.

This species is usually referred to *S. moluccana* Roxb., but the description of that is far too incomplete to be of any use in identification, and I have seen no species of the genus from the Moluccas.

Sonerila matangensis *Ridley*, sp. nov., a *S. begoniifolia* Bl., cui affinis, foliis undique molliter velutino-hirsutis lanceolatis acuminatis, capsulis verrucosis papillis parvis hirtis tectis differt.

Herba. Caulis dense velutino-hirtus, 5–9 cm. longus, 3 mm. crassus, simplex vel superne biramosus. *Folia* herbacea, majora lanceolata, acuminata, obtusa, dense velutino-hirta, basibus inaequaliter bilobis lobo inferiore rotundato 5 mm. longo, 6·5–8·5 cm. longa, 3–3·5 cm. lata, nervis tenuibus 3-jugis, nervulis parallelis remotis, petiolis dense velutino-hirtis 1 cm. longis ; folia minora ovata vel rotundata, acuta, 4 mm. longa. *Racemus* dense hirtus, floribus 2–5. *Calyx* obconicus, hirtus, 2 mm. longus. *Petala* 3, ovata, acuminata, rosea, parce hirta, 3 mm. longa. *Stamina* 4, filamentis petalis brevioribus, antheris oblongis obtusis una breviore, processu elongato attenuato e basi dorsali exorto. *Capsula* campanulata, verrucis parvis capillis terminatis tecta, 5 mm. longa, 5 mm. lata, pedicello crassiusculo 4 mm. longo.

Sarawak. Mt. Matang, *Haviland* 1049 (type), *Ridley* s.n.

This plant appears to be confined to Mt. Matang and differs from *S. begoniifolia* Bl. in its lanceolate softly hairy leaves, and in the very small warts on the fruit, each of which bears a terminal hair.

Sonerila tetraptera *Stapf* mss., descr. *Ridley*, sp. nov., a *S. calophylla* Ridley, cui affinis, antheris brevibus truncatis, floribus minoribus paucioribus, capsulis brevioribus differt.

Herba 8–15 cm. alta. *Caulis* tetragonus, basi tetrapterus, alis setis adscendentibus munitis. *Folia* carnosa, aequalia, obovata, basibus attenuatis acutis, apicibus rotundatis, marginibus integris vel denticulatis, superne setis sparse munita, subtus glabra, purpurea, 1–3 cm. longa, 1–1·5 cm. lata, nervis 1-jugis saepius obscuris ; petioli 2 mm. longi. *Pedunculus* 4 cm. longus, tetragonus, ruber, setiger. *Flores* usque ad 3, pedicellis brevibus hirtis. *Calyx* 2 mm. longus, urniformis, hirtus, dentibus acutis brevibus. *Petala* lanceolata, alba, acuta, 4 mm. longa. *Stamina* 3, breviora, antheris oblongis truncatis biporosis glabris. *Capsula* campanulata, dense minute pustulata, pustulis breviter setosis, 5 mm. longa, 4 mm. lata pedicello 4 mm. longo setoso.

Sarawak. Mt. Bongo, near Tegora, *Haviland* 2071 : " herb, leaves pinkish, petals white."

This resembles *S. calophylla* Ridley, of Kedah Peak, but the flowers are smaller, the capsules fewer and shorter and the anthers short and truncate.

Sonerila nana *Ridley*, sp. nov., a forma parvula *S. pictae* Korth., cui affinis, foliis ovatis supra setosis, floribus multo minoribus, capsula longiore differt.

Herba pusilla. *Caulis* puberulus, 8–11 cm. altus, adscendens. *Folia* aequalia, ovata, obtusa vel acuta, basibus acutis, supra parce setosa,

marginibus serrato-setosis, subtus costa nervisque 2-paribus puberulis exceptis glabra, 2·2 cm. longa, 1–1·5 cm. lata ; petioli puberuli, 5 mm. longi. *Racemus* 1 cm. longus, 4-florus. *Calyx* parce setosus, puberulus, anguste urceolatus, lobis triangularibus acutis. *Petala* rosea, lanceolata, acuta, 5 mm. longa. *Stamina* 3, subaequilonga, filamentis gracilibus, antheris lanceolatis acuminatis basibus sagittatis. *Stylus* filiformis, subaequilongus, stigmate minute capitato. *Capsula* campanulata, laevis, 5 mm. longa, 4 mm. lata, pedicello 6 mm. longo. *Semina* oblanceolata, glandulifera, 0·5–0·6 mm. longa, alis spathulatis.

Sarawak. Quop, petals pink, *Haviland* 542, 2209.

The only species I know really allied to this is *S. picta* var. *concolor* Ridl., a dwarf variety, but the flowers are much smaller, the leaves distinctly ovate, hardly lanceolate, and armed with bristles above. The description of the seeds I have taken from Stapf's drawing in Herb. Kew.

Sonerila grandis *Ridley*, sp. nov., species maxima, *S. repenti* King affinis, sed foliis magnis ovatis cordatis, cymis longis multifloris differt.

Herba glabra. *Caulis* ruber, succulentus, 19 cm. longus. *Folia* opposita, aequalia, herbacea, supra setis dissitis brevibus tecta, subtus glabra, ovata, acuminata, acuta, basibus rotundatis cordatis, marginibus denticulatis setosis, 13–18 cm. longa, 5·5–14 cm. lata, nervis 7, nervulis transversis usque 30 remotis 3 mm.–1 cm. distantibus ; petioli glabri, 5–9 cm. longi. *Cymae* axillares, glabrae, pedunculis 7·5 cm. longis, ramis terminalibus 2 divaricantibus 3 cm. longis, floribus secundis erectis 22 in ramo, pedicellis 2 mm. longis. *Calyx* anguste urceolatus, purpureus, 3 mm. longus, lobis brevibus ovatis obtusis. *Petala* 3, ovata, rosea, 4 mm. longa. *Stamina* 3, filamentis filiformibus 3 mm. longis, antheris longe acuminatis basibus sagittatis 6 mm. longis. *Capsula* obconica, angulata, glabra, laevis, dense minute punctata, 5 mm. longa, 4 mm. lata, pedicello 4 mm. longo.

Sumatra. Padang Panjang, Jan. 1913, *C. G. Matthew*.

The biggest species I have seen : the leaves resemble those of *Phyllagathis*. The cyme consists of two divaricating branches bearing two rows of erect flowers on the upper edge. It is glabrous except for some scattered clubbed hairs.

Sonerila pusilla *Ridley*, sp. nov., a formis nanis *S. begoniifoliae* Bl., cui affinis, foliis carnosis ellipticis obtusis subglabris differt.

Herba pusilla, caule simplici setis appressis tecto 2 cm. longo. *Folia* 3, crassiuscule herbacea, supra glabra, papillosa, elliptica, inaequilateralia, obtusa, basibus angustatis inaequaliter bilobis, marginibus setiferis, 2–2·5 cm. longa, 1·1–2 cm. lata, nervis 5 subtus appresse hirtis ; petioli 3 mm. longi, appresse setosi. *Flores* non visi. *Capsulae* campanulatae, pustulatae, 5 mm. longae, 5 mm. latae, 3 vel 4 in racemo brevissimo, pedicellis 5 mm. longis appresse setigeris.

Sarawak. Mt. Matang, *Ridley*, s.n.

I never succeeded in finding flowers of this little plant and have never seen other specimens. The leaves are fleshy, elliptic, rounded, very unequal-sided and blunt, and except for the nerves and edges which bear setae are quite glabrous. On the wider half are 2 nerves, on the other 1 only.

Sonerila minima *Stapf* mss., descr. *Ridley*, sp. nov., *S. pusillae* Ridley affinis, sed planta multo minor, nervis foliorum paucioribus, capsula longe hirsuta differt.

Herba 5 mm.–2 cm. alta, caule hirto. *Folia* inaequalia, majora ovata vel oblonga, obtusa, basibus inaequilateralibus, lobis rotundis, subtus hirta, marginibus hirtis, 5 mm.–1·6 cm. longa, 5–7 mm. lata, nervis e basi folii 2, e costa 2 ; petioli 3 mm. longi, rufo-hirti ; folia minora cordata, ovato-rotundata, subacuta, 2 mm. longa. *Flores* non visi. *Capsula* solitaria, campanulata, hirta, apicem versus punctata, 3 mm. longa, 4 mm. lata, pedicello crassiusculo hirto 5 mm. longo.

Sarawak. Mt. Dulit, 3–4,000 ft. alt., *Haviland & Hose* 3203.

Certainly the smallest species of *Sonerila* I know, belonging to the affinity of *S. begoniifolia* Bl. and *S. pusilla* Ridley, but very much reduced.

Sonerila nervulosa *Ridley*, sp. nov., a *S. Beccariana* Cogn., cui affinis, floribus multo minoribus, antheris oblongis obtusis, foliis multo minoribus obtusis differt.—*S. borneënsis* var. *setulosa* Stapf in Trans. Linn. Soc. Bot. **4,** 158 (1894).

Herba adscendens, caule basi lignoso superne pilis setiformibus tecto 5–10 cm. alto. *Folia* inaequalia, majora oblongo-obovata, obtusa vel breviter acuminata, basibus inaequaliter bilobis, lobo majore rotundato, utraque pagina setis sparsis munita, 5·5–10 cm. longa, 2·5–4 cm. lata, nervis 4–5 subtus dense hirtis, nervulis transversis remotis subtus conspicuis ; petioli dense setoso-hirti, 5 mm.–1 cm. longi ; folia minora rotundata, cordata, setosa, 4 mm. longa. *Racemi* breves, axillares, 3–4-flori, dense hirti, pedicellis 2 mm. longis. *Calyx* campanulatus, hirtus, 3 mm. longus, lobis dentiformibus. *Petala* rosea, lanceolata, sparse setosa, 4 mm. longa. *Stamina* 3, filamentis brevibus linearibus, antheris oblongis obtusis quam petala brevioribus. *Stylus* brevior, crassiusculus, stigmate capitato. *Capsula* campanulata, basi lata, dense minute papillosa, hirta, 5 mm. longa, 4 mm. lata.

Sarawak. Mt. Trekan, 2,000 ft. alt., *Hose* 639, 647 (type).

Brit. N. Borneo. Mt. Kinabalu, 3,000 ft. alt., *Haviland* 1285.

Var. **hirsutissima** *Ridley*, var. nov. foliis utrinque hirtis, capsula longe hirta.

Sarawak. Mt. Murud, at foot of mountain, *Moulton* 170.

Hose's specimens 647 are much larger than those numbered 639, from the same locality, and the Kinabalu plant (the type of Stapf's *S. borneënsis* var. *setulosa*), but it is clear that these plants all belong to one species, the latter forms being dwarf plants. In some of Hose's specimens the young leaves are densely hairy as they all are in the variety.

Allomorphia auriculata *Ridley*, sp. nov., ab *A. longispicata* Cogn., cui affinis, foliis lanceolatis longe acuminatis auriculatis, calyce parvo cupulato differt.

Suffrutex, caule lignoso brunneo ultra 7 cm. longo. *Folia* herbacea, glabra, lanceolata, longe acuminata, acuta, basibus in petiolos decurrentibus truncatis auriculatis, 14–20 cm. longa, 5–7 cm. lata, nervis 5 subtus elevatis, nervulis transversis remotis, reticulationibus laxis majusculis ; petioli 1·5–3 cm. longi. *Racemus* simplex vel ramo unico

praeditus, lateralis, gracilis, 27 cm. longus, furfuraceus. *Flores* parvi, pauci, in racemulis binis 2 mm. longis 1·5 cm. remotis dispositi. *Pedicelli* graciles, 1 mm. longi. *Calyx* cupulatus, 2 mm. longus, furfuraceus. *Petala* 4, triangularia, rostrata, flava, 2 mm. longa. *Stamina* 8, similia, petala superantia, antheris lineari-oblongis obtusis inappendiculatis. *Stylus* vix longior. *Capsula* campanulata, pallida, 2 mm. longa, valvis 4 rotundatis, pedicellis 5 mm. longis crassis.

Sarawak. Upper Baram, Gunong Temabok, *Moulton* 6866. Foot of Mt. Murud, flowers yellow, *Moulton* 130 (type).

This appears to be most closely allied to *A. longispicata* Cogn., collected in Sarawak by Beccari, which I have not seen but which, from the description, differs in the short cylindric non-furfuraceous calyx and elliptic-ovate obtuse leaves. The leaves are decurrent on the petiole, ending at the base in two short blunt auricles.

Phyllagathis peltata *Stapf*, mss., descr. *Ridley*, sp. nov., a *P. hirsuta* Cogn., cui affinis, foliis integris peltatis, petiolis glabris differt.

Herba, caule brevi glabro lignoso. *Folia* herbacea, ovata, peltata, cuspidata, supra glabra, subtus nervis 5 cum nervulis transversis remotis elevatis cum reticulationibus setis rigidis flavis munitis, marginibus incrassatis setosis, 12–13 cm. longa, 6·5–10 cm. lata ; petioli glabri, 11–14 cm. longi. *Scapus* 15–17 cm. longus, glaber. *Umbella* 4-ramosa, floribus usque 9. *Calycis lobi* oblongi, spinis acutis. *Petala* et *stamina* non visa. *Capsula* obconica, truncata, laevis, calyce brevior, 5 mm. longa, 3 mm. lata, pedicello 5 mm. longo. *Semina* minuta, obcuneata, truncata, laevia.

Sarawak. Baram, Mt. Dulit, 3–5,000 ft. alt., *Haviland & Hose* 3205.

This species (unfortunately only a ripe fruiting specimen has been procured) is allied to *P. hirsuta* Cogn., but is quite glabrous except for the setose back and edges of the leaves, and the leaves are completely peltate.

Medinilla muricata *Bl.*

Sarawak. Sine loc., *Beccari* 570. Busau, limestone, *Haviland* 68 ; Sarawak River, *Haviland* " b.p.t.a."

New record for Borneo.

Medinilla laxiflora *Ridley*, sp. nov., a *M. longipedunculata* Cogn., cui affinis, foliis petiolatis lanceolatis cordatis, floribus majoribus differt.

Frutex epiphyticus, ramosus, ramis pallidis dense verrucosis. *Folia* tenuiter coriacea, lanceolata, longe acuminata, acuta, basibus rotundatis cordatis quinquenerviis, 11–15 cm. longa, 3–5·5 cm. lata, nervis 5, nervulis transversis tenuibus anastomosantibus ; petioli 1 cm. longi, rugosuli. *Paniculae* axillares, elongatae, laxae, glabrae, pedunculis rubris gracilibus 3–4 cm. longis, ramis gracilibus flexuosis 4 vel 5 in apicibus umbellatis 2–8 cm. longis, internodiis 1 cm. longis. *Bracteae* ovatae, acutae, 1 mm. longae, oppositae, persistentes. *Pedicelli* rubri, sub anthesin 1 mm. longi, sub fructu 6 mm. longi. *Calyx* campanulatus, 3 mm. longus, margine sinuato vix lobato. *Petala* 5, oblonga, obtusa, unguiculata, 5 mm. longa, alba. *Stamina* 10, antheris elongatis cylindricis acuminatis, tuberculis basalibus 2 dentiformibus. *Stylus* brevior, gracilis, stigmate capitato.

Sarawak. Near Kuching, *Haviland* 1529k : " Growing on a large tree. Peduncles and pedicels red. Calyx waxy, pinkish white. Petals white."

Medinilla vulcanica Ridley in Journ. As. Soc. Mal. **1,** 61 (1923). I find that this name was anticipated by Merrill for a Philippine plant in 1917, so I herewith alter it to **Medinilla dumosa** *Ridley*, nom. nov., as it forms dense low thickets on the rocks of the Sibuyak volcano in Sumatra.

Medinilla Matthewi *Ridley*, sp. nov., a *M. penduliflora* Ridley, cui affinis, nervis foliorum pluribus, nervulis transversis conspicuis, panicula furfuracea, petalis rotundatis differt.

Frutex, caule pustulato. *Folia* coriacea, elliptica, basibus obtusis, 10–16 cm. longa, 5·5–8 cm. lata, nervis 5-jugis elevatis, nervulis transversis remotis conspicuis ; petioli crassi, 4 mm. longi. *Panicula* pendula, furfuracea, pendunculis 8·5 cm. longis, ramis in apice congestis umbellatis 3 cm. longis, ramulis umbellatis saepius 3 in ramo 1 cm. longis. *Bracteae* minutae, lanceolatae, acuminatae. *Calyx* campanulatus, 3 mm. longus, margine sinuato obscure lobato. *Petala* 5, late rotundato-ovata, alba, 6 mm. longa, 4 mm. lata. *Stamina* 10, similia, filamentis 2 mm. longis planis, antheris lanceolatis acuminatis, tuberculis 2 basalibus ad angulos. *Stylus* cylindricus, gracilis, stigmate capitato.

Sumatra. Gunong Tandikat, 5,000 ft. alt., *C. G. Matthew.*

This is one of the few Medinillas with long pendulous sprays of white flowers, allied to *M. penduliflora* Ridley, of the Malay Peninsula. It differs in the larger number of nerves in the leaf, and conspicuous transverse nervules, the scurfy inflorescence and rounder petals. In one specimen there are two whorls of flowers in the spray as in *M. penduliflora.*

Memecylon cephalanthum *Ridley*, sp. nov., a *M. glomerato* Bl., cui affinis, foliis ellipticis majoribus siccis olivaceis, capitulis majoribus, petalis triangularibus acutis latioribus differt.

Frutex, ramis teretibus 4 mm. crassis. *Folia* rigide coriacea, elliptica, obtusa, basibus cuneatis, costa supra depressa subtus elevata, nervis obscuris, 5·5–8 cm. longa, 2·5–3·5 cm. lata ; petioli 5 mm. lati. *Flores* in capitulis densis oppositis 2 cm. latis dispositi, pedicellis 2–3 cm. longis. *Calyx* campanulatus, 2 mm. longus, limbo obscure lobato 2 mm. lato. *Petala* 4, triangularia, subacuta, 2 mm. longa. *Stamina* breviora, antheris brevibus curvis obtusis. *Stylus* filiformis, 4 mm. longus. *Drupa* ovoideo-globosa, 4 mm. longa.

Brit. N. Borneo. Labuan, *Motley* 207.

This species is certainly near *M. glomeratum* Bl., which occurs also in Borneo at Kuching (*Bartlett ; Haviland & Hose* 3679 : " flowers dirty white ") and was also collected in Sumatra at Indragiri, Sungei Latok, by *Curtis* (No. 3555), and I doubt very much if Miquel is not correct in referring to this species Hooker and Arnott's Canton plant *M. nigrescens*, which seems to me merely a poor form of it.

In *M. cephalanthum* Ridley, the leaves are broader, elliptic, blunt, and do not dry black as in *M. glomeratum* Bl. The heads of flowers are much larger and the petals are broader and not long-beaked.

Memecylon Havilandii *Ridley*, sp. nov., a *M. costato* Miq., cui affinis, nervis inconspicuis pluribus, intramarginali margini approximato, floribus in axillis capitatis differt.

Frutex ?, ramis superne quadrangulatis. *Folia* coriacea, laevia, elliptica, obtuse acuminata, basibus rotundatis, subsessilia, 10–22 cm. longa, 4·5–9 cm. lata, nervis inconspicuis circiter 22-jugis, intramarginali margini approximato ; petiolus 2 mm. longus vel subnullus. *Flores* pauci, in capitulis axillaribus brevibus. *Bracteae* binae, lanceolatae, acuminatae, persistentes, 1 mm. longae. *Pedicelli* graciles, 7 mm. longi. *Calyx* campanulatus, basi globosus, limbo latiore integro 2 mm. longo. *Petala* brevia, oblongo-rotundata, 3 mm. longa. *Stamina* breviora, filamentis brevissimis, antheris rectis conicis. *Stylus* vix longior.

Sarawak. Kuching, *Haviland* 1630.

Allied to *M. costatum* Miq., but the faintly visible nerves are much more numerous, the intramarginal nerve quite close to the leaf-edge and the flowers clustered in the axils.

Memecylon scolopacinum *Ridley*, sp. nov., a *M. subtrinervio* Miq., cui affinis, foliis multo minoribus longe cuspidatis, alabastris obtusis, floribus paucioribus in pedunculo brevissimo differt.

Frutex vel *arbor parva*, ramis apice quadrangulatis pallidis. *Folia* coriacea, laevia, sicca virescentia, lanceolata, longe obtuse cuspidata (cuspide lineari obtusa 2 cm. longa), basibus breviter cuneatis, 5–5·5 cm. longa, 1·5 cm. lata, nervis obscuris ; petioli 2 mm. longi. *Flores* pauci, in pedunculo crassiusculo 1–2 mm. longo congesti, alabastra obtusa. *Bracteae* lanceolatae, 2 mm. longae vel minores. *Calyx* campanulatus, margine integro, 3 mm. longus. *Petala* 4, rotundata, 4 mm. longa, 3 mm. lata. *Stamina* 8, filamentis acuminatis, antheris curvis lanceolatis ferme 2 mm. longis, glandula dorsali lineari-oblonga. *Stylus* brevis, staminibus aequilongus. *Drupa* obconica, superne 8-costata, 3 mm. lata.

Sarawak. Limbang, *Haviland* 543, 2208 (type) ; Benkaran, *C. J. Brooks* 300 (ex Herb. Hewitt).

Allied to *M. subtrinervium* Miq., which, however, has the nerves distinct whereas in *M. scolopacinum* Ridley they are quite invisible, and the leaves are much larger ; the buds too are acute, and the flowers more numerous on a distinct peduncle.

Araliaceae

Arthrophyllum ovalifolium *Miq.*

Sarawak. *Beccari* 934.

This seems to be rare outside the Malay Peninsula.

Arthrophyllum rufo-sepalum *Ridley*, sp. nov., ab *A. diversifolio* Bl., cui affinis, foliolis oblongis acuminatis, panicula rufo-furfuracea, calycis lobis apice rufo-furfuraceis differt.

Arbor, umbellis exceptis glabra. *Folia* 30 cm. longa ; foliola 7, subcoriacea, opposita, oblonga, cuspidata, basibus subacutis inaequilateralibus, 15 cm. longa, 5 cm. lata, nervis supra depressis subtus elevatis 6-paribus, nervulis paucis inconspicuis ; petioluli 8 mm. longi. *Paniculae* ultra 12 cm. longae, ramis umbellae 4 cm. longis rufo-furfuraceis. Flores

in umbella circiter 25, pedicellis 5 mm. longis. *Calyx* urceolatus, subangulatus, 2 mm. longus, lobis 4 ovatis apicibus rufo-furfuraceis. *Petala* 4, ovata, subacuta, 2 mm. longa. *Stamina* 4, antheris parvis subgloboso-oblongis, filamentis brevibus. *Stylus* minutus.

SARAWAK. Selabat, *Haviland* " l.m.m.f."

Arthrophyllum rubiginosum *Ridley*, sp. nov., ab *A. elliptico* Bl., cui affinis, foliolis crassioribus minoribus, calycibus pedicellisque rufo-furfuraceis, petalis cuneatis acuminatis differt.

Arbor, floribus exceptis glabra. *Folia* trifoliolata, supremis unifoliolatis ; foliola subcoriacea, supra glabra, subtus praesertim in costa parce furfuracea, ovata, breviter acuminata, obtusa, basibus rotundatis, 4–12 cm. longa, 2–5 cm. lata, nervis 5-paribus subtus elevatis inter se intra margines arcuantibus ; petioli 1·2–2 cm. longi, longitudinaliter rugosi. *Umbellae* furfuraceae, pedunculis 7–10 cm. longis. *Flores* ad 30 in umbella congesti, pedicellis atro-rufo-furfuraceis 5 mm. longis. *Calyx* obconicus, atro-rufo-furfuraceus, 3 mm. longus, limbo undulato, dentibus 5. *Petala* 5, cuneata, acuta, 4 mm. longa. *Stamina* 5, filamentis crassiusculis apicibus decurvis, antheris majusculis oblongis curvis apiculatis. *Discus* crassus, pulvinatus. *Stylus* crassus, conicus, obtusus, brevis.

SARAWAK. Baram, Miri river, *Hose* 566, 591 (type), 668.

This is allied to *A. ellipticum* Bl. (*A. Blumeanum* Zoll. et Mor.), but the leaflets are stiffer and smaller and when dry rugose. The calyx and pedicels are covered with a dark red scurf a little of which may often be seen on the backs of the leaves. The petals are lanceolate cuneate and subacute. This, like *A. ellipticum* Bl. and several other species, has been referred to *A. diversifolium* Bl., a species confined to Java and apparently scarce there, and very distinct. I have not seen the larger lower leaves of this plant, but they are probably bipinnate.

Schefflera aruensis *Ridley*, sp. nov., a *S. borneënsi* Merrill, cui affinis, foliolis tenuioribus oblanceolatis basibus attenuatis, calyce obconico differt.

Frutex. *Foliola* subcoriacea, glabra, oblongo-oblanceolata, breviter obtuse acuminata, basibus sensim attenuatis obtusis, 26 cm. longa, 11 cm. lata, costa subtus incrassata elevata, nervis tenuibus 6-paribus, secundariis gracillimis circiter 12-paribus, reticulationibus laxis irregularibus ; petioluli angulati, 9 mm. longi vel longiores. *Paniculae* glabrae, scabridae, 38 cm. longae. *Umbellae* dissitae, pedunculis 1 cm. longis, pedicellis 5 mm. longis. *Flores* in umbella 7–10. *Petala* et *stamina* non visa. *Discus* pulvinatus, cerebriformi-rugosus. *Stylus* brevis, crassus, conico-cylindricus.

ARU ISLANDS. Sine loc. exact., *Riedel*.

Schefflera lasiocalyx *Ridley*, sp. nov., a *S. subulata* Viguier, cui affinis, floribus sessilibus, calyce pilis dense tecto, petalis oblongis truncatis differt.

Frutex, caule vaginis ovatis coriaceis pallidis 1–2 cm. longis 5 mm.–1 cm. latis instructo. *Folia* 5-foliolata ; petioli 9 cm. longi ; foliola elliptica, longe acuminata, basibus attenuatis, coriacea, 9–14 cm. longa, 5–5·5 cm. lata, nervis tenuibus 6-paribus, reticulationibus laxis conspicuis ; petioluli 1·5–3·5 cm. longi. *Paniculae* graciles, superne pilis stellatis

mollissimis tectae, 30 cm. longae. *Flores* circiter 11, in capitulis sessiles, pedunculis 5 mm.–1 cm. longis. *Calyx* campanulatus, pilis stellatis albescentibus dense tectus, 2 mm. longus. *Petala* 4, oblonga, truncata, 2 mm. longa. *Stamina* 4, filamentis longis filiformibus, antheris oblongis. *Discus* albescens, rugosus. *Stylus* brevis, crassus, conicus.

SARAWAK. Near Kuching, *Haviland & Hose* 3212.

This is very near to *S. subulata* Viguier, but the flowers are quite sessile, the calyx covered with a dense thick white woolly mat of stellate hairs, and the petals are oblong and truncate.

Schefflera laxiflora *Ridley*, sp. nov., a *S. corona-sylvae* Viguier, cui affinis, differt foliolis multo majoribus coriaceis, paniculis laxis ramosis, floribus minutis.

Frutex glaber, ramis pallidis, stipulis persistentibus lanceolatis acuminatis coriaceis 1·5 cm. longis. *Folia* 3–4-foliolata ; petioli validi, 15 cm. longi ; foliola coriacea, elliptica, longe acute acuminata, basibus cuneatis, 20–30 cm. longa, 8·5–14 cm. lata, costa subtus elevata crassa, nervis gracilibus 6-paribus inter se arcuato-anastomosantibus, reticulationibus latis conspicuis. *Paniculae* terminales, basi ramosae, 15 cm. longae, ramis gracillimis 10–14 cm. longis patentibus pubescentibus. *Umbellae* circiter 10-florae, pubescenti-furfuraceae, pedunculis 1·2 cm. longis, pedicellis purpureo-brunneis 4 mm. longis. *Flores* perparvi, albi. *Calyx* campanulatus, 1 mm. longus. *Petala* oblongo-ovata, 1 mm. longa. *Stamina* 4 vel 6, alba, filamentis gracillimis filiformibus 5 mm. longis, antheris parvis ellipticis. *Ovarium* triloculare.

SARAWAK. Bidi, limestone, " colour white, stalks purple brown," *C. J. Brooks* 1 (type) ; Mt. Koum, limestone, *Haviland* 1713 ; near Kuching, *Haviland* 2949 : " Pedicels etc. brown. Stamens white, 4 to 6. Petals valvate (?) caducous. Ovary 3-celled."

Schefflera corona-sylvae *Viguier.*

SARAWAK. Rejang, Sibu, *Haviland* 1877.

The specimen exactly resembles the Javanese species.

Schefflera rubiginosa *Ridley*, sp. nov., a *S. borneënsi* Merrill, cui affinis, foliis majoribus pilis stellatis rufo-pilosis, basibus rotundatis, floribus rufo-pubescentibus differt.

Frutex epiphyticus. *Folia* 5-foliolata ; petioli 60 cm. longi ; foliola coriacea, subtus dense rufo-ferruginea, pilis stellatis tecta, elliptica, acuminata, basibus rotundatis, nervis elevatis 9-paribus, costa crassa, reticulationibus laxis, 20–24 cm. longa, 10 cm. lata ; petioluli 6 cm. longi. *Stipulae* lanceolatae, coriaceae, 2·5 cm. longae. *Paniculae* 50 cm. longae, ferrugineae. *Umbellae* 13–14-florae, pedunculis 2–2·5 cm. longis, pedicellis 5 mm. longis. *Calyx* campanulatus, 1 mm. longus, pilis stellatis tectus, margine integro. *Petala* 4 vel 5, ovata, obtusa, ferruginea, 2 mm. longa. *Stamina* 5, brevia, filamentis brevibus crassiusculis, antheris ellipticis. *Discus* griseus, multirugosus.

SARAWAK. *Beccari* 888, 1231 (type) ; Mt. Matang, epiphyte, *Haviland* 831 ; Kuching, *Haviland & Hose* 3393.

This is allied to *S. borneënsis* Merrill but has much larger leaves covered with rufous stellate hairs beneath.

Schefflera grisea *Ridley*, sp. nov., a *S. rubiginosa* Ridley, cui affinis, foliolis subtus glabris griseis, nervis pluribus differt.

Arbor 3–5 metras alta. *Folia* 4- (vel pluri-) foliolata ; petioli crassi, teretes, 60 cm. longi ; foliola coriacea, subtus grisea, minute rugosa, elliptico-oblonga, basibus rotundatis, 27 cm. longa, 9·5 cm. lata, costa subtus elevata, nervis 13-paribus gracilibus subtus elevatis, secundariis paucis, reticulationibus laxis ; petioluli 9 cm. longi. *Paniculae* racemiformes, dense hirtae, setis flavescentibus basi longioribus obsitae, 50–93 cm. longae, validae, pedunculis 2–2·5 cm. longis (sub fructu 4 cm. longis) hirtis, pedicellis 5 mm. longis pilis stellatis minutis tectis. *Flores* in umbella circiter 20. *Bracteae* lanceolatae, hirtae, 1 cm. longae. *Calyx* campanulatus, margine integro, 2 mm. longus. *Petala* 5, triangularia, obtusa, puberula, 1 mm. longa. *Stamina* 5, brevia, antheris oblongo-ellipticis. *Discus* conicus, valide costatus. *Stylus* nullus.

Sumatra. *Beccari* 535 (type) ; Sibolangit, Bukit Kluang, near Medan, *Mhd. Nur* 7433 : "Tree 10 to 15 feet tall."

I have not seen a complete leaf of this plant, but as a section, apparently half, bears four of the leaflets, it probably has at least eight.

Thymelaeaceae

Gonystylus augescens *Ridley*, sp. nov., affinis *G. borneënsi* Gilg, a quo foliis multo majoribus et crassioribus, ramis paniculae dense sericeo-hirtae accrescentibus, sepalis ovatis nec lanceolatis distat.

Arbor parva. *Folia* ovata vel oblonga, breviter obtuse cuspidata, basi rotundata, 15–22 cm. longa, 10–13 cm. lata, crasse coriacea, glabra, costa superne depressa subtus elevata ; nervi 12-jugi, utrinque elevati, intra margines inarcuantes, secundarii plures, fere aequaliter conspicui, cum primariis anastomosantes ; petioli 1 cm. longi, crassi, transverse rugosi. *Panicula* terminalis, crassa, sericeo-hirta, 2–3-ramosa, 4–15 cm. longa ; bracteae oblongae, obtusae, 5 mm. longae, caducae ; pedicelli 1 cm. longi, crassi, sericei. *Flores* plures, seriatim expansi. *Sepala* 5, ovata, 5 mm. longa, sericeo-tomentosa. *Petala* 16, breviora, lanceolato-linearia, hirta, acuminata. *Stamina* 16, brevia ; antherae oblongae. *Ovarium* ovoideum, hirtum, triloculare ; stylus sinuatus, hirtus, stigmate rotundato. *Capsula* lanceolata, 4·5 cm. longa, 1·4 cm. crassa, lignosa. *Semina* lanceolata, acuta, solitaria.

Sarawak. Kuching, *Haviland* 488, 2078.

This species is very distinct in the inflorescence, which consists of a panicle of two or three rather thick branches which elongate as the flowers open and fall leaving an alveolus surrounded by thick silky hairs. The bracts, which are large for the genus, fall before the flowers open. As the raceme-like branches elongate, the internodes between the flowers lengthen to 8 mm. and become nearly glabrous. The fruit, of a lanceolate outline, with a lanceolate seed, may be not quite ripe, but it is very distinct in form from any other species of which the fruit is known.

G. Maingayi *Hook. fil.*

Sarawak. Near Kuching, *Haviland* 3660.

I cannot separate these specimens from the Malay Peninsula plant.

A NEW SPECIES OF ARISAEMA.

The late Prof. E. Barnes.

Arisaema auriculata *E. Barnes*, sp. nov., affinis *A. Barnesii* C. E. C. Fischer, sed foliorum segmentis majoribus sessilibus cuspidatis vel breviter acuminatis, spathae limbo basi auriculiformi, inter alia differt.

A rather large tuberous *herb*. *Corm* about 2·5 cm. diam., flesh pale green, outer surface dark and wrinkled. *Roots* fibrous, emerging from the upper part of the corm, pale pink. *Cataphylls* 2, clasping the base of the petiole, reddish-brown mottled, tips rounded, the longer about 20 cm., the shorter about half as long. *Leaf* solitary ; petiole up to 56·5 cm. long, cylindric, rather thick and fleshy, smooth, brownish-pink or flesh-coloured, mottled lighter, and with small scattered red spots, sometimes pale green, unmottled ; blade radiatisect, leaflets usually 5, occasionally 3, 4, 6 or 7, sessile, elliptic to elliptic-obovate, up to 28 cm. long and 10 cm. broad, rarely up to 35 by 16 cm., upper surface light green, about 15 pairs of nerves distinct but not strong, intramarginal nerve running round the upper half or two-thirds, sometimes continuing indistinctly to base, margin thickened and with a minute brownish frilled edge, under-surface pale glaucous, with a downy appearance and feel but not pubescent ; tip cuspidate or shortly acuminate. *Peduncle* solitary, emerging from the petiole about 1/3 of the way from the base of the latter, often curved round the petiole, slender, cylindric, almost white. Tube of *spathe* narrow, cylindric (very narrowly funnel-shaped in male inflorescences), 7·5 cm. long in front and 9·5 cm. at back to beginning of dome, up to 1·3 cm. in diameter, flesh-coloured with dull reddish longitudinal striations (under a lens these are seen to be bands of crimson spots), mouth revolute and forming a broad rim about 15 cm. wide, base of limb domed, upper part broader than long, 6 cm. across, sides rounded, terminal portion triangular with the two halves somewhat folded together so that the tip projects forward, light green flushed brownish-crimson, veins numerous and distinct. (Owing to the base of the limb being domed the upper part is brought forwards and downwards and is pressed against the front of the tube. The turned-out margins at the sides of the mouth, and the sides of the limb which curve over them, form a wide round opening at each side of the spathe. It is by these openings that insects enter the tube.) *Female flowers* crowded together on the lowest 2 cm. of the spadix ; ovaries globose, green, glossy ; stigmas tufted, almost sessile. *Spadix* narrow just above the female flowers and bearing a few filiform or flattened neuters ; then dilating to a broad, irregularly cylindric, pinkish portion, about 2·5 cm. long, of a soft cellular texture ; then tapering to a curved, forward-pointing, narrow end, 2·5 cm. long, with a rounded apex and corrugated surface. *Male flowers* consisting of groups of about 6 globose, liver-coloured, sessile anthers, no neuters in male inflorescences, appendage as in female but more slender. (As in other S. Indian species, there is a small aperture at the base of the tube in male spathes, but not in female. In some plants the right margin of the spathe overlaps the left, in others the left is over the right.) *Berries* (immature) about 4 mm. in diam., globose, mature not seen.

1
2
3
♂
4
♀
5

INDIA.—Growing in large clumps on high rocks on the Nilambur Ghat, Nilgiri Wynaad, 2,500—3,000 ft., fl. July, *E. Barnes*.

This species comes very near to *A. Barnesii* C. E. C. Fischer, from which it differs in being larger in all parts, leaf-segments sessile, cuspidate or shortly acuminate, intra-marginal vein extending to two-thirds from the apex, and the limb of the spathe being auriculate at the base. The large ear-like openings at the sides of the spathe, the broad deflexed limb and the light green leaves with the glaucous under-surface distinguish it from other S. Indian species. In one inflorescence the lower half of the fertile portion of the spadix bore female flowers and the upper portion male flowers. In another some of the neuters above the female flowers were replaced by stamens.

The illustrations accompanying this description were drawn by Mr. T. C. Paul.

1, leaf ; 2, spathe, dorsal view, and base of petiole ; 3, male inflorescence, spathe detached, in front view ; 4, female inflorescence, ditto, with apex of spathe folded back showing inner surface ; 5, base of plant with corm. All × ½.

NOTES ON SOME SPECIES OF THE GENUS CRYPTOLEPIS R. BR. : I.

E. A. BRUCE.

The object of these notes is to clarify the position of some closely allied species of the genus *Cryptolepis*.

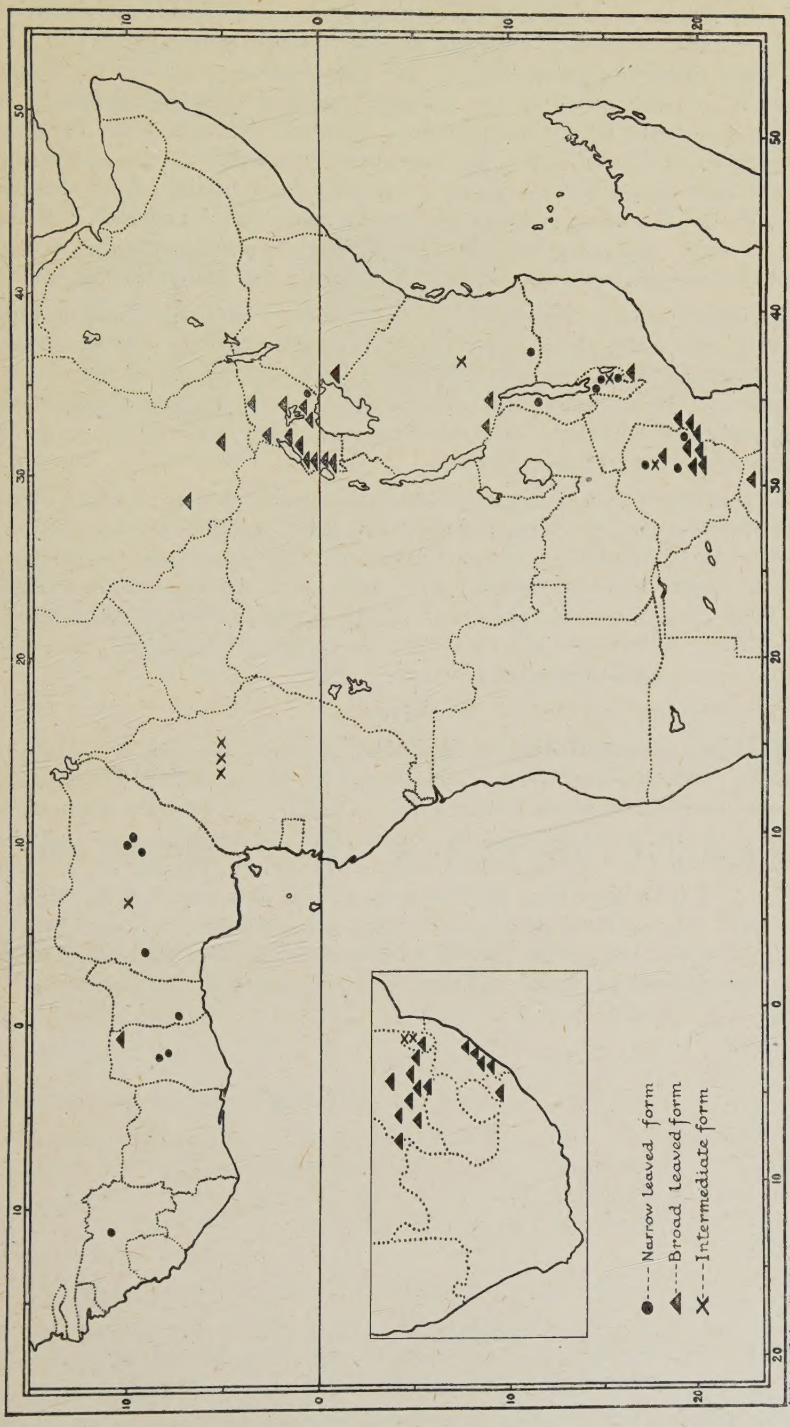
There seem to be no clear and constant characters on which to differentiate the species *C. oblongifolia* (Meisn.) Schltr. and *C. nigritana* (Benth.) N.E. Br. In the Flora of Tropical Africa Dr. N. E. Brown, in his Key, distinguished them by the size and shape of the leaves :—

Leaves lanceolate to elliptic-oblong, 2—5 times as long as broad .. .. *oblongifolia*

Leaves linear or linear-lanceolate, 4½—12 times as long as broad .. .. *nigritana*

In the descriptions which follow, the only other differential character mentioned is the shape of the bracts, which are said to be ovate and obtuse in *oblongifolia* and ovate-lanceolate and acute in *nigritana*.

The types of both species (*Krauss* 322 and *Barter* 1324) were dissected to see if any other distinguishing characters were present, but nothing of value was observed. It is quite possible to separate the type specimens on the characters used by Dr. N. E. Brown, but when an attempt was made to sort the Kew material into the two species it was found that there were a large number of specimens which might equally well be placed in either group. The specimens were then re-examined with reference to the floral structure, type of inflorescence and size of fruit. There was



Map showing known distribution of *Cryptolepis oblongifolia* (Meisn.) Schltr.

variation in all these characters, but nothing constant which could be used as a specific character. The sinus-pocket varied from emarginate to truncate and toothed ; the flower-bud though generally acute was sometimes subacute or obtuse ; the inflorescence was lax or dense, subsessile or pedunculate ; the fruits on one specimen varied from 7 to 12 cm. in length, whilst the leaves on another specimen from Pretoria varied from one-and-a-half to five times their breadth. It was interesting to note that frequently the fruiting branches had broad elliptic leaves, whilst on the flowering ones the leaves were narrowly lanceolate. Thus, though there was variation, there were no consistent features which could be grouped together and used to separate the plants specifically.

The distribution of the species was then plotted on a map, and though the majority of the West African specimens fell into the narrow-leaved group and the South African were of the broad-leaved form, there were exceptions. There were also intermediate forms in the Cameroons, Tanganyika, S. Rhodesia and the Transvaal, and both types occurred in East and South Tropical Africa.

The possibility of hybridization was considered, but there seemed to be no clear-cut grouping of characters which would uphold this supposition. Indeed, the variation on single specimens was sometimes sufficiently striking to give the appearance of a "mixture." In view of these facts and after careful consideration and study of the collectors' field notes, the writer is of the opinion that only one plastic, widespread, variable species exists—**C. oblongifolia** (*Meisn.*) *Schltr.*

The synonymy is therefore as follows :—

Cryptolepis oblongifolia (*Meisn.*)*Schltr.* in Journ. Bot. **34,** 315 (1896). *Ectadium ? oblongifolium* Meisn. in Hook. Lond. Journ. Bot. **2,** 542 (1843). *Secamone acutifolia* Sond. in Linnaea **23,** 76 (1850). *Ectadiopsis oblongifolia* (Meisn.) Benth. in Benth. et Hook. f. Gen. Pl. **2,** 741 (1876). *E. acutifolia* (Sond.) Benth. l.c. *E. nigritana* Benth. in Hook. Ic. Pl. **12,** 75, t. 1187 (1876). *E. Welwitschii* Britt. in Trans. Linn. Soc. Bot. Ser. 2, **4,** 26 (1894), non Baill. *E. nigritana* Benth. var. *congesta* K. Schum. in Engl. Jahrb. **23,** 232 (1896). *Cryptolepis Elliotii* Schltr. in Journ. Bot. **33,** 300 (1895). *C. nigritana* (Benth.) N.E. Br. in Dyer, Fl. Trop. Afr. **4** (1), 251 (1902).